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Domesticating global policy on GMOs: comparing India and China[1]

Peter Newell

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INSTITUTE OF DEVELOPMENT STUDIES
Brighton, Sussex BN1 9RE
ENGLAND

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Summary

This paper compares the way in which two leading developing countries in the global debate on biotechnology have sought to translate policy commitments contained in international agreements on trade and biosafety into workable national policy. It is a complex story of selective interpretation, conflict over priorities and politicking at the highest levels of government. It connects the micro-politics of inter-bureaucratic turf-wars with the diplomacy of inter-state negotiations and coalition-building. At the same time, the role of business and civil society actors, media and scientific communities, will also be shown to be key.

It is argued that global commitments take on a fundamentally different shape once they have been refracted through domestic political processes. The analysis shows that competing policy networks that cut across the state and form part of global alliances seek to interpret international legal obligations in ways which help to consolidate their position within the bureaucracy. Working with allies in industry or among civil society groups, different government departments seek to domesticate loosely worded and often ambiguous obligations contained in trade and environmental agreements, such as the Cartagena Protocol, in ways which advance their political goals. This political manoeuvring takes on global dimensions when alliances are formed with international scientific, industry or activist communities to bolster positions adopted domestically. Likewise, domestic politics get played out in global fora as these agreements are being negotiated, where countries such as India and China have to adapt negotiating positions to a shifting sense of how the national interest is best served and navigating a course which is likely to be acceptable to key domestic constituencies when the agreement comes to be implemented. Each country also has a sufficiently clearly defined interest in biotechnology that international processes are regarded as an opportunity to "internationalise" domestic policy preferences and secure scope for discretion in national policy-making.

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Preface

Biotechnology Policy Series

This IDS Working Paper series emerges from a series of three interlinked projects. They involve collaboration between IDS and the Foundation for International Environmental Law and Development (FIELD) in the UK and partners in China (Center for Chinese Agricultural Policy (CCAP)), India (Centre for the Study of Developing Societies, Delhi; Research and Information Systems for the Non-Aligned and Other Developing Countries (RIS), Delhi; National Law School, Bangalore), Kenya (African Centre for Technology Studies, Nairobi) and Zimbabwe.

Three key questions guide the research programme:

- What influences the dynamics of policy-making in different local and national contexts, and with what implications for the rural poor?
- What role can mechanisms of international governance play in supporting the national efforts of developing countries to address food security concerns?
- How can policy processes become more inclusive and responsive to poor people's perspectives? What methods, processes and procedures are required to "democratize" biotechnology?

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1 Introduction

A key driver of biotechnology policy in all countries is international agreements such as the Cartagena Protocol on Biosafety set up to manage the international trade in GMOs. While many countries had developed general guidelines on research into biotechnology, and some had provisions for the handling of transgenics entering the country before the Protocol's arrival in 2000, very few had in place detailed procedures for risk assessment and biosafety management. At the same time, an increasing number of developing countries are joining the WTO and have become signatories to a range of agreements on agriculture and intellectual property rights, for example, that impact upon the way they handle biotechnology development and biosafety issues at the national level.

The interesting question from the point of view of this research is the extent to which these global commitments change the nature of the national policy process in India and China. In this regard key questions include; how far and in what ways do they impact upon domestic policy processes of priority-setting and regulation for example? Which factors explain the different ways in which the same international agreements have been translated in the two countries? How have India and China attempted to reconcile their obligations under these international agreements with existing domestic priorities and regulatory structures?

Both countries are now members of the WTO and have signed, though in China's case not ratified, the Cartagena Protocol on Biosafety. As larger developing countries they are placed differently in terms of the political and economic power they are able to wield compared to other countries that have been studied as part of this research, namely Zimbabwe and Kenya. The two countries make for an interesting comparison because, despite a number of such parallels, there is much which sets them apart in terms of the course their approach to biotechnology regulation has taken and the role, for example, of business and civil society organisations in contesting the way in which the governments of India and China have sought to "domesticate" global policy commitments.

It is argued here that global commitments take on a fundamentally different shape once they have been refracted through domestic political processes. The analysis below shows that competing policy networks that cut across the state and form part of global alliances seek to interpret international legal obligations in ways which help to consolidate their position within the bureaucracy. Working with allies in industry or among civil society groups, different government departments seek to domesticate loosely worded and often ambiguous obligations contained in trade and environmental agreements, such as the Cartagena Protocol, in ways which advance their political goals. This political manoeuvring takes on global dimensions when alliances are formed with international scientific, industry or activist communities to bolster positions adopted domestically. Likewise, domestic politics get played out in global fora as these agreements are being negotiated, where countries such as India and China have to adapt negotiating positions to a shifting sense of how the national interest is best served and navigating a course which is likely to be acceptable to key domestic constituencies when the agreement comes to be implemented. Each country also has a sufficiently clearly defined interest in biotechnology, that international processes

are regarded as an opportunity to "internationalise" domestic policy preferences and secure scope for discretion in national policy-making.

This account is therefore at odds with prevailing academic orthodoxy about the ways in which domestic politics impact upon international politics and vice versa. While Putnam's (1988) concern was with the ways in which the possibilities for international cooperation are circumscribed by patterns of domestic politics, Keohane and Milner's (1996) approach aimed to look at how the process of "internationalization" is serving to reconfigure politics at the national level, even within fairly closed and autarkic societies. While both accounts generate important insights into the links between the "competing" arenas of domestic and international politics, each adopts a somewhat linear understanding of how one influences the other. The approach here is explicitly to understand how two countries that bear similar international legal commitments have processed, interpreted and "domesticated" those obligations in very different ways. This requires us to look at the political webs which bind global negotiations to intra-governmental decision-making on an ongoing basis and how these are contested and shift over time. Looking at the role of particular departments, and indeed particular individuals within those departments, it becomes clear that some are more embedded within global processes than others and that understanding their location within domestic political settings means understanding the policy networks they form with like-minded government officials in other countries, industry and NGO allies and voices sympathetic to their position within the scientific community. Viewed this way, the importance of policy styles, bureaucratic politics and transnational coalition-building to understanding the interpretation and implementation of global commitments, becomes clear.

In policy terms, the paper suggests the limits of attempts to promote universalised and "one size fits all" models of biosafety regulation across the world. For reasons of promoting international trade and realising the commercial potential of GMOs, bodies such as the OECD and to a lesser extent the Cartagena Protocol itself, have sought to encourage countries to adopt broadly similar models of biotechnology regulation that are minimally disruptive of trade (Newell 2002). The issue is not just the appropriateness of standard prescribed measures for countries with enormously diverse ecologies and capacities for effectively regulating the trade in GMOs or undertaking rigorous risk assessments, but the naivety of attempting to generate political conformity through international law. It is clear from this paper and from other work (Mackenzie and Newell 2003), that perhaps the strongest and most effective pressures towards policy conformity in the global politics of GMO regulation derive from bilateral trade pressures and threats to bring legal cases at the WTO. These have been used to discipline those countries adopting regulatory models threatening to the interests of biotech exporters and often act as a far more immediate catalyst to action than the well-intended but abstract commitments contained in the texts of global legal instruments on biosafety.

2 Context

Both India and China have relatively long histories of promoting and developing biotechnology spanning several decades. Each has seen in biotechnology the potential to deliver development gains through the application of hi-tech science to the industrialisation and modernisation of agriculture. Agricultural biotechnology potentially has a key part to play in China's agricultural rural development. China faces the challenge of feeding 22 per cent of the world's population using only 7 per cent of the world's cultivable land (SEPA u.d). With high levels of rural poverty, declining yields from many key crops and damaging levels of pesticide use, technologies that promise to reduce reliance on chemical inputs and boost yields are a welcome development. The same is in many ways true of India, with problems such as limited land availability and a rapidly expanding population adding to a sense of crisis in agriculture upon which 700 million people depend for their livelihood. Policy documents such as the National Agricultural Policy in 2000 have strongly emphasised the role of biotechnology in helping to meet national agricultural goals.

Because of this, both countries have sought to promote biotechnology development through strong state-funded research programmes. In China's case, against a background of ambitious science programmes in Europe and North America (in the form of EURIKA and the Strategic Defence Initiative respectively), four top scientists made a proposal to Premier Deng Xiaoping, in which the development of biotechnology featured highly, which he approved in March 1986. This was to become programme 863, the platform of biotech development in China (MoST 2001).[2] As far back as 1982, the Indian government established the National Biotechnology Promotion Board which became the Department of Biotechnology (DBT) in 1986. In the years following the creation of the DBT, the state sector invested more than 90 per cent of the funds in biotech research and development (Dhar 2002:7). Since that time, the role of the private sector has increased quite rapidly, whereas in China the private sector still plays a relatively small overall role in biotech development, partly because of the sorts of constraints on foreign investors that India removed in the early 1990s. Despite these constraints on private sector investment, in overall terms investment in the biotech sector in China vastly outstrips India. Total investment in plant biotechnology in China in 1999 was estimated to be US$112 million (in purchasing price parity terms) while the Indian government averages an expenditure of US$15 million per year (in PPP terms). According to Huang *et al.* (2001), even after private sector investment is added to the equation, plant biotechnology research expenditures in India are still only about 20 per cent of those in China.[3]

In terms of approvals of GM crops, since 1997, Beijing has approved the release of more than 100 genetically altered crops, double the number released in the United States (Smith 2000). Overall, 251 GM plants, animals and recombined micro-organisms have either been approved for field trials, environmental

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2 The programme has been divided into five year cycles consistent with central government five year plans, with biotech featuring in each plan.

3 In actual terms the budgetary allocation for all types of biotechnology in India has trebled from $150 million in 1987–88 to $300 million in 1997–8 and $500 million in 2002–3 ('Allocation to biotech up threefold since 1987' *Economic Times*, 8 April 2003: 6).

release or commercialisation (Huang *et al.* 2001).[4] However, as with India, only *Bt* cotton has been successfully commercialised thus far. Large biotech companies such as Monsanto are interested in developing *Bt* corn in China and have conducted field tests for the crop since 1997. At one point GM tobacco was also thought to hold a great deal of potential. In 1998 it became the first GE crop to be grown commercially (PANUPS 2001). Production of the crop was halted and withdrawn from the market in 1992 , however, as key buyers, such as Philip Morris, got cold feet following consumer resistance to GM products in general and the US imposed restrictions on imports of the product in particular (SiliconValley 2002). Rice has been the other area of commercial interest following Monsanto's and Syngenta's work on the "golden" rice genome project (Kurtenbach 2000). In India there is also some interest in rice, but the next crop that looks set to be approved is a variety of high-yielding mustard for which ProAgro is seeking approval for commercialisation. There are also a number of crops and vegetables at various stages of development and field trial. For example, contained field trials have been taking place in the case of tobacco, mustard, potato, tomato and brinjal (Dhar 2002).

Traditionally, biotech development has been conceived as strongly consistent with the national interest as defined by the heads of the two countries. India's Prime Minister Atal Bihari Vajpayee stated at the Science Congress in Delhi in 2001 that India's vision included 'shaping biotechnology into a premier precision tool of the future for creation of wealth and ensuring social justice especially for the welfare of the poor'. This vision, articulated in exactly these terms, provides the mandate of the department that is in many ways at the centre of biotechnology regulation in India, the DBT (DBT 2003). In China, support for the technology has also been declared from the highest echelons of the state. In his Government Work Report delivered to the National Peoples' Congress in March 1999, then Chinese Premier Zhu Rongji said 'We should work vigorously to develop agriculture through science and technology, information technology and other high and new technologies, accelerate the work of breed selection and improvement and spread the use of advanced, applicable techniques which can increase production and income' (Ma 1999). The productionist paradigm which underpins Premier Rongji's remarks reflects the way in which in China 'the double helix has replaced the atom as the symbol of the modernization drive' according to Smith (2000: 1).

In the early days of biotech development in China, the prevailing attitude, as one official put it, was; 'First we have to make people rich, then security can be improved'. More recently, however, Chinese biotech policy has expressed a greater degree of uncertainty about the future of the technology, despite continuing levels of high investment in the sector.[5] There is less consensus now than was the case even a year or two ago about the political and economic costs associated with following a strongly promotional position on biotech and no new crops have been commercialised since 1999. This shift results in part

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4 Of these approvals, regulators approved 45 applications for field trials of GM plant varieties, 65 for commercial release and 31 for commercialisation (Huang *et al.* 2001).

5 According to MoST's annual report for 2001 of the six priority areas that receive funding 'Biotechnology and advanced agriculture' attract both the largest number of projects (30 per cent) and the highest levels of expenditure (27 per cent) (MoST 2001).

from strategic choices about the need to export food to European publics sceptical about the safety of GM crops. This signal was received loud and clear when Chinese soy sauce was rejected by the UK because it contained GM ingredients from the US. This was said to be 'the most direct cause for the new labelling restrictions in China' (PANNA 2001), discussed below. The move towards process-based regulations also suggests that China has started to follow a precautionary position more akin to the European stance than that of North America.[6] The discussion below makes clear that protection of Chinese producers and promotion of China's own biotechnology enterprises are also key factors in this shift of position. This helps to explain the restrictions on foreign investment that other commentators have taken as evidence of a "cooling" towards the technology. Overall it would appear that the combination of global market imperatives and domestic commercial considerations make what Huang and Wang refer to as a "wait and see" strategy the only viable and strategically sensible option to adopt, allowing China to keep open all options about its future agricultural development (Huang and Wang 2003).

While also affected by these global developments, the Indian government has faced a more difficult path in seeking public acceptance of GM crops. Their introduction into the country was swept up in broader debates about the pace of liberalisation in the country, the appropriate role of multinational companies in the Indian economy and, invoking powerful symbolism from India's colonial history, the threats to national sovereignty posed by western control of key resources in India such as seeds. What is interesting is that India, despite these auspicious beginnings, is now looking to move forward with biotech development and approvals of GM crops at the very time that China appears to have a de facto moratorium on further commercialisation, at least in the short term. Despite this, the case by case and precautionary emphasis within India's biosafety regulations, like China's, places it's overall approach closer to the European model of biosafety regulation than to that of the US.

China can be considered to be pursuing a dual strategy in which it seeks to consolidate its position as a global contender in GMO production, but is also keen to open market channels to Europe and elsewhere where there is demand for non-GM produce. There has been some discussion, for example, of the suitability of China aping Brazil's strategy of seeking to export GMOs from some areas and GM-free produce from other parts of the country. The Ministry of Agriculture has floated the possibility of developing the North-East into the world's largest producer of non-genetically modified soybeans over the next five years (Reuters 2003a). This dual strategy would mean that China would 'push forward fast on GM foods which offer high yield and resistance to disease while promoting GM-free areas for crops for sale to rich markets where many consumers still reject the idea of genetically modified food' (SiliconValley 2002).

China has attempted to steer a careful course between biotechnology development and the provision of effective biosafety measures, a course that has been charted by the shifting winds of public opinion, trade pressure and ongoing re-evaluations of which positions make most strategic sense to adopt. China

6 Greenpeace interviews, Beijing, 7 April 2003.

has been a member of the WTO since December 2001, but also signed the Cartagena Protocol on Biosafety on 8 August 2000 (*China Daily* 2002). Its concern with biosafety measures can also been seen as a response to trade imperatives. China fears that countries in Europe, as well as Japan and South Korea, may reject its products unless GM crops are kept under control (Silicon Valley 2002). Wu Kongming, who heads a panel of experts conducting safety tests for the Agriculture Ministry, commented that 'The general sense is that the risks are too high and the market is too small' for most genetically modified plants (NGIN 2002).

India also of course faces a situation in which it has to reconcile its commitments under the WTO with its obligations under the CPB. While India has been a member of the WTO for longer, it will be become clear later that the country has also faced a difficult adjustment period with opposition to membership from the start and resistance to many of the required reforms in the agricultural sector. On the question of a "dual strategy", while some groups in India have been pushing for an expansion of non-GM organic agriculture, including Vandana Shiva's Research Foundation for Science, Technology and Ecology, Greenpeace and local groups working on issues of agriculture and farmers' rights such as Green Foundation in Bangalore, many barriers stand in the way in terms of lack of available fertile land and strong cultures of heavy pesticide use among farmers. For food grown on such land to meet the certification standards of bodies such as the Soil Association, they would have to be cultivated for three years without any pesticide use before they would be considered organic. This is clearly not an option for many smaller farmers in India.

A further interesting element of the comparison, that will be returned to below, is the way in which the two countries situate themselves in relation to one another regarding biotech development. The idea of China as a biotech superpower has been invoked in media-led constructions that resonate in policy circles in India in order to underscore the enormous potential of agricultural biotechnology and the urgency with which it is to be tapped if India is to compete with China in this area (Newell 2003a). Slow-downs in the process are regarded as missed opportunities to catch-up with China. P.K. Ghosh, former advisor to DBT and member secretary of the Research Committee on Genetic Manipulation, regrets that when Monsanto and MAHYCO proposed *Bt* cotton back in 1993, a decision was stalled which meant that India "lost the bus" that would have allowed them to surpass China's technological supremacy in this area.[7] Industry groups such as the Confederation of Indian Industry also draw on this sense of a zero-sum competition between India and China, where potential investors are "waiting and watching" to see which signals the government sends out about its likely stance on approvals for LMOs, to create pressure on government officials to speed up the approval process. Interestingly, Indian government officials also readily cite the savings in pesticide use, the absence of detrimental environmental affects and the positive benefits accruing to smaller farmers from GM crops in China in support of their advocacy of GM crops in India.[8] The analysis underpinning this narrative is weak on detail, importantly regarding the extent to

7 Interview with Dr P.K. Ghosh, Scientific Advisor, DBT, Delhi, 28 March 2001.
8 Interview with Dr S.R. Rao, DBT, 4 April 2001.

which there is scope to apply in India the Chinese model of agribiotech development. Key differences that are often glossed over in the rush to present China as a viable model for India to follow include; the different capacities for public sector research, the divergent degrees of dependence on external market acceptance, as opposed to producing for domestic consumption, and, importantly, the contrasting role of civil society in contesting the benefits of the technology.

3 Trade liberalisation in the agricultural sector

This section of the paper looks at those aspects of trade liberalisation that interface with the domestic commitments of China and India in relation to biotechnology and biosafety. Analysis is divided into; (i) the drivers and impacts of trade, (ii) global political strategies, (iii) styles of trade policy, (iv) reconciling rights and (v) bureaucratic politics. The purpose is to compare how the two countries have managed the conflicts, dilemmas and trade-offs that result from simultaneously implementing agreements which have different goals and are often incompatible with one another. This helps to shed light on the different actors and policy processes around biotechnology and related subjects in the two countries.

On the face of it, the challenges which face India and China are, in many ways, identical. Both are globally significant trade actors with large domestic markets. Both face enormous difficulties in complying with trade obligations and each, albeit in different ways, has faced internal conflict over the appropriate relationship between biotechnology, trade and agriculture. Nevertheless, the different pace of liberalisation in the two countries' agricultural sectors, which relates to their different histories of engagement with global trade regimes, has created distinct drivers of liberalisation as well as produced interesting political coalitions contesting the impacts and benefits of liberalisation. While conflict over the pace of liberalisation exists in both countries, in China the fissures are formed within government between globalising state bureaucrats, concentrated in the Ministry of Commerce,[9] and those whose political agendas are better served by protecting rural China from rapid exposure to global markets. In India, civil society groups have mobilised around trade issues for some time and continue to be involved in debates around the appropriate relationship between intellectual property rights, plant variety protection and farmers' rights, for example. Some have successfully formed alliances with elements within government concerned about the impact of such measures on rural livelihoods. The role of such groups, as well as of the farmers' movements active on these issues in domesticating global policy, is discussed in Section 6.

While both countries have been subject to intense foreign pressure concerning their rules on GM labelling in China's case and intellectual property protection in India's, they have sought to defend their interests in different ways. While both have worked to develop alliances within the WTO among fellow members of the G77, different policy cultures have meant that China tends to operate in a less confrontational manner in global arenas, but works to keep policy options open at the national level. The

[9] As a result of recent restructuring, the Ministry of Commerce now subsumes the State Economic and Trade Commission and what was formerly known as MoFTEC, the Ministry of Foreign Trade and Economic Cooperation.

government of India, on the other hand, is more comfortable adopting adversarial positions internationally, but has manifested less willingness or ability to use stalling and obfuscatory tactics at the national level in the face of global scrutiny. These trends are explored in more detail below.

3.1 Drivers and impacts

India's path to liberalisation was set much earlier than China's beginning in the late 1980s. By the end of the 1980s there were still only twelve private sector seed firms in India, focussing mainly on the development of improved hybrids (Dhar 2002). In 1989, under the Plants, Fruits and Seeds Order, the import of seeds was freed from government control. The proliferation of this sector of the market took off after the National Seed Development Policy in 1988 which allowed firms based in India that had entered into collaboration with foreign firms to import seeds. The programme of economic liberalisation launched in 1991 served to hasten this process. Private sector investment in the seed sector in India more than tripled between 1993 and 1997 to a level of investment of Rs 19,850 million. In terms of share of the sector, judged by volume of seed sales, the private sector outstripped the public sector in 1996/7 in relation to both sales of maize and sunflower seeds. The National Seed Policy of 2001 seems set to consolidate this pattern of growth within a liberalised economy (Ramakrishna 2003).

China's liberalisation process has been driven by a combination of internal and external pressures. Internally, "globalising state bureaucrats" have sought to use WTO membership to lever greater power over provincial government, backed by influential economists pushing for the removal of barriers to the liberalisation of the economy in general, and agriculture in particular. The drive to liberalise markets in China has also come from exporters anxious to secure market access, however. A letter to US House of Representatives speaker Larry Combest from the US-China Business Council for example, signed by groups such as the American Seed Association and the Biotechnology Industry Organization, large traders such as Archer Daniels Midland and Cargill as well as individual firms such as Monsanto and Pioneer Hi-Bred International, called on the US government to grant Normal Trade Relations status to China, such as is accorded to other WTO members (US-China Business Council 2000). Such status was thought to be key for market access for agricultural products as well as for obliging China to reform its monopoly state purchasing agencies and stop the subsidization of exports. Slightly more ominously for China, for the US-China Business Council, a key attraction of China's membership of WTO is that 'The US will have recourse to the WTO dispute settlement mechanisms should China not live up to any of its obligations' (US-China Business Council 2000).

In advance of the deal, bold claims were made about the gains to US agriculture of China's membership of the WTO. Agriculture Secretary Dan Glickman said that this would result in $2 billion per year in expanded exports to China (Solomon 2000).

But, the extent to which US agribusiness can realise foreseen gains in practice remains a moot point. China's Chief WTO negotiator and Vice Minister of the Ministry of Foreign Trade and Economic

Cooperation,[10] Long Yongtu, said in the *Guangzhou Daily* that although China had agreed to allow 7.3 million tonnes of wheat from the US to be exported each year, it was a "complete misunderstanding" to expect this grain to enter China. Instead, such exports remained a theoretical opportunity (*The Agribusiness Examiner* 2000). Long's response suggests that, whatever the letter of the agreement, the Chinese government will not let its producers feel the full effects of global market competition over night, and perhaps points to what has been referred to as 'entrenched bureaucratic opposition to the implementation of WTO-consistent rules' (China Business Review 2002). Beyond resistance at the centre, Thiers (2002: 413) also highlights the importance of local resistance to the implementation of international trade regimes as officials at province level seek to maintain protection against imports. Under this interpretation, hopes that WTO membership would serve to regularise many of China's legal and economic practices appear optimistic and premature (Blum 2002).[11] Clearly then, the formal agreements granting China entry to the world's most significant trading club is just the first step in a complex liberalisation process that will not unfold smoothly or predictably.

It is also the case that the immediate gains for China are not clear. As the US-China Business Council proudly boasts, 'While the United States gains access to its growing market, China does not gain any greater access to the US market under the negotiated agreement, making it a win-win for American agriculture' (US Business Council 2000). Nolt claims; 'The . . . agreement imposes much more substantial concessions on China than on the US, which merely grants permanently what it has long granted annually anyway' (Nolt 1999: 2), while providing other states with protection from a rise in Chinese imports (Breslin 2003). China is at a large disadvantage in this relationship because of the extent of subsidies received by US farmers and the way in which, by contrast, farmers in China are taxed by the state (Lu 2001). Proposals to address this problem, and therefore to redress this imbalance, run into the problem that village leaders depend on this taxation for income and are reluctant to relinquish it.[12]

The precise impact of liberalisation in China's agricultural sector is not yet clear. However, Smith paints a stark scenario

> Chinese farmland is fragmented into tiny plots, each worked by several people, and the costs to grow a bushel of wheat, rice or corn is higher than in the United States or Europe. After China joins the WTO, a move that will wipe out many import restrictions on foreign agricultural products, the country's slender farm incomes will shrink even more than they already have from falling grain prices and rising expenses.
>
> (Smith 2000: 1)

Wang argues that it is precisely those groups who have borne the costs of other recent reforms that will be hit hardest by the implementation of WTO commitments. Politically this is significant because 'those

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10 MoFTEC is now subsumed within a new Ministry of Commerce.

11 A white house statement in March 2000 declared confidently that 'China's accession to the WTO will . . . increase the likelihood that it will play by global rules' (cited in Breslin 2003: 25).

12 Interview with Prof Xia Youfu, 4 April 2003.

losers happen to be the social groups that have long served as the political bases of the communist regime' (2000: 373). Specifically in relation to seeds, cuts in duties may threaten farmers producing grains like corn and soybeans which are more expensive and of poorer quality than imported seeds. In addition, production efficiency is still relatively low in China and domestic grain prices are normally higher than international prices. This is also true of India, and the greatest fear among many seed traders in India is the threat posed by cheap Chinese seeds to their own livelihoods. In response, some Indian firms seek to distinguish their products on the basis of quality, comparing them favourably to the cheap material produced in a country where regulations exist in "name only".[13] The trust they have established with the buyers of their seed also provides an important advantage, because as employees of Rallis proclaim, 'farmers want to be able to go to distributors if there is a problem, you can't do this with Chinese seeds'.[14]

In the long-term, however, biotech companies have tried to suggest that the "crisis" in Chinese agriculture can only be offset by the adoption of their products. David Shi, Monsanto's government and public affairs director, argues that while imported grains will pose a threat to local grains once China opens up, 'Chinese farmers now earn only 400 yuan per mu (1/15 hectare). But with our *Bt* technology, they could earn 300 yuan more per mu' (Reuters 1999). Many in China are sceptical of these claims and would prefer to see imports of soybeans that are GM free from Brazil rather than accept the growth of GM soy in China. Indeed a South-South trade with countries such as Brazil is seen by some as a viable option to reduce China's dependence on GM imports from the US. China is also the largest exporter of maize in Asia and is now exporting non-GM maize to Brazil. The desire to preserve this position may help to explain the government's stance on imports of *Bt* corn from Monsanto, discussed below. Bai Jinming, Deputy Director General of the Ministry of Agriculture has also emphasised the "key role" of China's own so-called "dragonhead agribusinesses" in meeting some of the challenges of WTO accession because they are closer to farmers and better placed to boost agricultural production in rural areas that will be increasingly important in the face of global competition (Bai 2001).

An assessment of the impact of trade liberalising measures in China is further complicated by the ambiguity surrounding China's status within the WTO. Though it is officially treated as a developing country and receives special and differentiated treatment,[15] its accession agreement, perhaps the most restrictive of all new entry deals, made far more concessions than other developing countries and even some developed countries have done in the past (Breslin 2003). For example, while developing countries can have a limit of 10 per cent agricultural subsidies, China's final agreement was for subsidies for agricultural production at 8.5 per cent of the value of farm output. The deal was a product of a combination of international posturing and domestic coalition-building. While there was, and remains, significant disquiet in some quarters about the impact of liberalisation, particularly in the agricultural

13 Interview with seed company representative.

14 Interviews with Dr Ramanujan (scientist), Dr B. Dutta (Biotech Science Officer), Dr V.R.Patil, (Head Biotechnology Division), Rallis, Bangalore, 11 May 2001.

15 For example a generalised system of preferences allows special consideration for exports from developed states. Developing country status also means continued import restrictions in agriculture and protection for infant industries for example.

sector, as noted above, "globalising state bureaucrats" within MFTEC (Ministry of Foreign Trade and Economic Cooperation),[16] with the strong personal backing of then Premier Zhu, were successful in pushing the deal through (Breslin 2003). Lai (2001) argues that this exclusive decision-making circle of top Chinese leaders was ultimately able to circumvent opposition to the agreement, partly helped by the overwhelmingly positive coverage of the benefits of China's entry in the media. The agenda of this globalising élite, according to Breslin, is 'to lock China into multilateral trade norms and promote domestic political and economic change within China' (2003). As an indication of their success in achieving this, MFTEC[17] announced in May 2002 that more than 2,300 laws and regulations had been amended to comply with WTO rules and 830 abolished since the country joined the trade body on 11 December 2001 (*China Business Review* 2002).

3.2 Global political strategies

Politically, China's alliances within the WTO tend to shift according to the issue. On some issues China works closely with other large developing countries such as India, Mexico and Brazil in expressing concerns about the timetables for the lifting of quantitative restrictions or resisting more restrictive patenting provisions under Article 27.3b under TRIPs for example, which relates to the patenting of living organisms. Yet China also works closely with the Cairns group in pushing for the liberalisation of markets within agricultural issues on the WTO. Within global debates, India's Ministry of Agriculture also forms alliances with the EU and countries such as China against those seeking to strengthen patent protection including the US, Canada, Australia and Japan. Yamin notes (2003: 39); 'India [has] played a leadership role in the negotiation of the TRIPs agreement in at the WTO . . . defending it's long standing tradition of limiting IPRs to protect public policy goals of advancing developments in the agriculture and pharmaceutical sector'. The foras where the two countries can advance concerns over farmers' rights issues include the International Undertaking on Plant Genetic Resources, where alliances with other members of the G77 can be formed. Indeed, many members of the G77 group have been sharing drafts of legislation in this area, aimed at developing their own approach to the protection of farmers' rights concerns.[18]

It is probably fair to say however that neither India nor China have always been fully cognisant of the implications of the deals they have struck at the WTO. Some of the concessions made by China at the time of its accession agreement to the WTO perhaps go further than was acknowledged at the time (Breslin 2003). This is the case for the elimination of all export subsidies for example. Because of "single undertaking" provisions negotiated in the Uruguay Round, countries often have to accept a bundle of agreements even if they object to the terms and conditions of individual agreements. On presenting the Patent Bill to the Lok Sabha in India, Ramakrishna quotes the Minister of Commerce and Industry as

16 As noted above MoFTEC is now part of the Ministry of Commerce.
17 Ibid.
18 India signed the International Treaty on Plant Genetic Resources for Food and Agriculture on 10 June 2002.

saying that India's acceptance of TRIPs had been on a "take it or leave it basis" as part of a package of agreements (2003: 8).

China is also finding it difficult to meet tough SPS and TBT standards in Europe and the US, which are often regarded as excuses for protectionist measures, imposing short time-frames and setting unrealistic standards.[19] Despite these objections, the costs involved and the high standards of evidence required to bring a claim have served to deter the Chinese government from bringing a case to the WTO dispute settlement panel. It is also the case that in terms of significance for the agriculture sector as a whole in China, it should be borne in mind that, according to unconfirmed estimates, only 3–5 per cent of total agricultural produce in China is exported and therefore the significance of these standards in overall terms in shaping the direction of Chinese agriculture should not be exaggerated. This may change of course if China moves towards the production of better quality, higher value crops. One implication of trying to meet TBT and SPS standards, however, has been a heightened role for scientific expertise within government decision-making since the advent of China's membership of the WTO and the requirement for technical inputs into discussions about sanitary and phytosanitary measures, for example. There has also been pressure on the Chinese government from the US, EU and Japan to centralise decision-making on trade issues so that governments and exporters do not have to deal with multiple agencies each with a different mandate.[20] The merging of the State Economic and Trade Commission and the Ministry of Foreign Trade and Economic Cooperation under the Ministry of Commerce can be seen as a move in this direction. This of course resonates with the calls of industry associations in India, mentioned below, for a one-stop, stream-lined approval process for biotechnology products rather than a protracted sets of negotiations with multiple government departments (AIBA 2000).

3.3 Styles of trade policy

Trade policy-making has come under increasing international scrutiny in the wake of developments in biosafety regulation in China. On 7 June 2001, the Chinese State Council announced the 'Safety Management Regulations for GMOs in the Agricultural Sector'. Imports of GMO products were to be certified as harmless to people, animals and the environment before they could be sold in the Chinese market. The regulation required mandatory labelling on products before they could be retailed, with the State Council establishing a committee to supervise the evaluation of the safety of GMO products (Sun 2001). The compulsory labelling rules were to come into force by 1 July and were welcomed by environmental groups, such as Greenpeace, because they located China nearer to the process-based labelling approach of the EU (Greenpeace 2002).

Many, however, viewed the new rules as an explicit non-tariff barrier with the Chinese government 'intent on setting up the barrier before WTO entry to protect the domestic market' (Sun 2001). Biotech companies were quick to suggest that China's new rules on labelling and importation exploited global fears

19 Interview with trade specialist University of Business and Economics, Beijing, 8 April 2003.
20 Meeting with Siobban Peters, Environment Adviser, UK embassy, Beijing, 8 April 2003.

regarding the safety of GMOs in order to protect its domestic biotech industry. Chinese government officials were keen to assure investors that 'Concerns over GMO safety will not disrupt world trade' as Minister of Agriculture Du Qinglin declared (Blanchard 2003). Nevertheless, the issue provoked a dispute that was so serious that according to John Gittings of *The Guardian* newspaper in the UK, it 'at one time threatened to derail WTO entry and was only resolved at the Asia-Pacific Economic Cooperation meeting attended by the US President George Bush' (Gittings 2001). The fact that rules on biosafety are thought to be grounds for questioning China's entry into the WTO gives an indication of the strategic economic importance attached to the export of GMOs to China.

Foreign biotech firms have not been left to fight the battle alone. Their positions on the various incarnations of China's biosafety regulations have been actively supported and advanced by government officials acting on their behalf. Following China's imposition of a temporary moratorium on GM soybean imports while regulations were developed, President Bush made a high-level visit in February 2002 to persuade the government to keep trading channels open while regulations on biosafety were recast. Referring to the trade in soybeans, a trade adviser to the US agriculture secretary said 'it's a billion dollar market to us' access to which is being denied by 'unreasonable delays' (quoted in Gittings 2001). Chief agricultural negotiator, Allen Johnson of the US Trade Representative office said that after two days of talks with his Chinese counterparts his mission had been a success and that he expected that China would take necessary steps to 'adjust its regulations so as not to hold up $1 billion worth of annual US soybean exports to China' (Smith and Rugaber 2002). Agriculture Secretary Ann Veneman was also keen to echo the fact that assurances had been obtained from officials from the Ministries of Agriculture, Trade, Science and Technology, as well as the State Planning Commission and AQSIQ, the quarantine and inspection agency, that China will meet its WTO obligations and ensure that US-China trade is not affected by the new regulations (UDS 2002). Euphemistically, Veneman also suggested that the US stood ready to provide 'technical and other assistance to help with their compliance' with WTO rules and regulations (USDA 2002). Understating the case dramatically, Allen Johnson acknowledged that Bush's visit helped pave the way for the interim settlement.

In order to resume imports of agricultural products that contain GMOs, the Ministry of Agriculture's GMO Safety Regulation Office in China issued its first batch of preliminary GMO safety certificates to 19 foreign firms on 18 April 2002 and thereafter to a further twenty firms for products that have been approved in the exporting country and for which applications have been initiated in China (Dow Jones 2002b). Despite this deal, further delays became apparent shortly afterwards causing concern among US officials and consternation among biotech firms. Delays were justified by the Chinese government on the grounds that 'Some foreign firms did not provide enough material as required by the regulations, especially on safety evaluation . . . We can't make our judgement based on the materials they provided' (Yee 2002). The delay was a seen as an about turn by the government nevertheless after 'Markets celebrated briefly after China agreed to issue temporary safety certificates to kick-start stalled trade, especially in soybeans where a billion dollars worth of trade a year with the US was at risk' (ibid: 1). The change left foreign companies "scrambling" to re-submit applications for labelling imports under the

supplementary rules issued by the Ministry of Agriculture (MoA 2002). This experience seemed to realise the fears of traders that despite the agreement, 'China's trade ministry could still play games with import approvals for individual traders' (Smith and Rugaber 2002). Nevertheless, the Chinese government look set to extend the interim rules, originally due to expire in December 2002, until April 2004 according to comments made to industry by officials from the Ministry of Agriculture (Reuters 2003b). This will apply to grain products for which tests have already been conducted. After this date firms are hopeful that full safety certificates will be issued subject to five yearly renewals in place of these temporary approvals.

These episodes have led critics to contest the coherence and transparency of policy-making and the practicality of enforcing the decisions taken. For example, supplementary rules created by the Ministry of Agriculture in March 2002 required firms to provide information on the contents, size of the labels and where it is going to appear on the products (Yee 2002). The rules required process labelling for all imported biotech soybeans, corn, rapeseed, cottonseed and tomatoes. Some analysts suggested that the new procedures would increase the costs of importing genetically modified crops by as much as 10–20 per cent (Sun 2001). Many importers complained about the short notice they were given. The issue of transparency and the coherence of government decision-making featured highly in this discussion. One industry commentator noted; 'One the one hand you are at the mercy of the agriculture ministry for certificates and in the other hand you need the quarantine department to get an import licence' (quoted in Yen 2002).

Often what causes complaint is the lack of details on implementation rather than the rules themselves, however. When Beijing announced the new rules on GMOs in June 2001, it fell short of establishing a process for implementation, a fact that frustrated many traders at home and abroad, especially those involved in soybeans. Such details are key for traders unsure about the implications of new rules for their orders when shipments may have to pass stricter quarantine requirements. A trader with an international grains firm in Beijing said; 'We still need the authorities to spell out a clear timeframe before we can make any decision to book orders . . . without a timeframe it's as risky as sitting on a volcano that will explode anytime' (Yee 2001). A key concern then is that the vagueness of the regulations will provide few signals to firms and leave significant discretion regarding implementation to enforcement agencies (PANNA 2001). Skilfully invoking the discourse of WTO compliance in defending their actions, the government justification for this information vacuum, advanced by Long Yongtu, Vice Minister of the Ministry of Foreign Trade and Economic Cooperation, was that time had to be taken to ensure that implementation of the rules is consistent with China's WTO obligations (ibid).

Rather like in India, there are also reservations about the practicability of elaborate labelling systems for GM produce in China, which industry describe as "unimplementable". Outside of key urban centres such as Beijing and Shanghai, there is little expectation that rules on labelling of GM ingredients will be applied in practice, at least in the short-term. There is virtually no evidence of labelling within Beijing, despite rules being in place proscribing the practice. In India, most foods are still sold on open markets, supermarkets are not yet common place and packaging is therefore not at all widespread. Given that packaging is the means by which consumer information is carried, it becomes easy to see why labelling is

viewed as unrealistic, even if segregation and certification systems could apply to products on entering the country.[21] Currently in China, crushers and producers are meant to label products before sending them to supermarkets, but there is virtually no enforcement in the market place, despite the fines that can be levelled at the food industry if foods are found to contain GMOs.[22] Segregation may happen by default, however, through the actions of major food retailers responding to consumer concerns by committing themselves not to sell GM foods in China (Greenpeace 2003).

Ultimately, despite these constraints, EU laws on labelling and traceability (COM 2001) may require that more extensive tracking and monitoring of where products are produced and ingredients derived are required, even if full systems of labelling remain a distant prospect. Exporters from India and China to other countries in Asia may also have to meet labelling requirements. Japan, Korea, Thailand and Taiwan have all now set up labelling schemes that exporters will have to conform to. External market drivers such as this and the work of the WTO recognised joint FAO and WHO Codex Alimentarius Commission will also have a decisive influence on the practice of labelling in India and China as elsewhere (Newell 2003b).

3.4 Recognising rights

As a member of the WTO, China will also be expected to meet its obligations under the Trade-Related Intellectual Property Rights agreement (TRIPs).[23] When the TRIPs agreement took effect on 1 January 1995, developing countries were given five years to ensure compliance with TRIPs (Yamin 2003). China's patent law prohibits patents on plants and animal varieties under Article 25, even if individual genes can be patented (unlike many other developing countries) (MOST 1984). The rationale for this is that genes are treated as chemical material rather than living organisms which cannot be patented. When a patented gene is used to create a new variety, this protection does not extend to the new variety. Hence, while Monsanto has sought to patent the gene for its GM soybean elsewhere, it has not attempted to do so in China.

Despite the fact that leading firms such as Monsanto claim to be keeping some of the best varieties out of China because of poor levels of IP protection, since accession to the WTO China has not faced significant pressure to amend its laws on patenting, considering itself largely TRIPs-compliant following amendments that were made to China's patent law as part of the accession agreement to the WTO introduced in 1992 and 2000.. Hence, despite the publicity attracted to Greenpeace's claims about the implications for Chinese farmers of Monsanto's attempt to patent a soybean variety, discussed below, the issue appears not to have generated as much controversy as in India. Practical considerations also play a part here. Most Chinese firms in the agricultural sector are not yet in a position to benefit from IP protection and concerns have been expressed about the difficulty of enforcing a strict IPR regime in a

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21 China has a greater level of experience of labelling systems, however, and so may be better placed than India on paper to meet any new requirements for product labelling. The country has standards for green, organic and "normal" foods depending on the level of pesticides that are permitted in their production.

22 China enforces a 0 per cent threshold of GM content in products that are alleged to be GM-free, the lowest threshold in the world.

23 China is also a member of WIPO (World Intellectual Property Organisation).

small-farm dominated agricultural system (Huang, Hu and Rozelle 2002). Companies such as Pioneer that work on maize with agricultural research institutes, for example, face no restrictions on their products because they are only involved in conventional breeding in China, while Syngenta focuses more on vegetable seeds in China for which adequate protection exists from their point of view.[24] Securing market access seems to be a more important issue than IPR protection for most firms at this stage, though there is scope for priorities to shift towards the latter, over time (Noshab 2002).

China also has a Plant Variety Protection (PVP) system in place. China's position on this issue follows the UPOV 1978 provisions but there is a question mark over whether it constitutes a *sui generis* system as required under TRIPs as an alternative to patenting of living organisms. Notably cotton is not on the PVP list that China agreed to when it joined UPOV 1978 and is not included in the list of protected crops under it's Plant Variety Protection regulations. Monsanto is making money, however, on its *Bt* cotton variety and though counterfeit versions of its seeds are being sold illegally, it has yet to lobby for change.

Despite the proactive stances adopted in international fora, described above, India also continues to have to revise its domestic laws in order to make them TRIPs-compliant. The relevant legislation in this regard is the First and Second Patent Amendments Acts, the Plant Variety and Protection and Farmers' Rights Act, which was passed by the parliament in August 2001, and the Biological Diversity Act (Seshia 2002). When the attempt by the GoI to amend the Patent Act failed in 1995, the U.S filed a case against India through the dispute settlement mechanism of the WTO which found against India. In order to comply with the ruling, GoI enacted in 1999 the Patent Amendment Act to accept product patent applications from 1 January 1995 onwards and to provide exclusive marketing rights to such applicants (Ramakrishna 2003). Various adjustments have been made to the Patent Act to make it TRIPs compliant, but in the process the provisions excluding plants from patent protection have been significantly diluted.[25]

Though India has had to introduce patents for micro-organisms and microbiological processes because it is mandatory under TRIPs, it has been able to restrict the scope of patents on life by prohibiting patents on cells, cell-lines and genes. The government was obliged, however, to set up a system for the protection of plant varieties given that the 1970 Patent Act excludes plant varieties from protection. India has established a *sui generis* system for plant varieties pursuant to Article 27.3(b) of the TRIPs agreement. The PVP and Farmers' Rights Acts exclude plant varieties and seeds from patentability and allows farmers to save, exchange and share seed, going against the wishes of multinational companies that wanted to restrict the selling of protected varieties.[26] In its general approach, as with China's legislation, it follows the UPOV 1978 approach to these issues.[27] Seshia notes that in spite of the fact that

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24 Interview with representative from Syngenta China.

25 The Patent Amendment Act of 2002 is due to come into force at the time of writing in May 2003.

26 The Indian parliament passed the Protection of Plant Varieties and Farmers' Rights Act in 2001. It had not come into force at the time of writing.

27 The Indian Act adopts the less stringent version of UPOV 1978 (as opposed to 1991) where Plant Breeders' Rights are conferred only over 'reproductive and vegetative propagating materials of the protected variety'.

India is not currently a signatory of UPOV, in drafting the PVP legislation, the PVP laws of 15–16 UPOV member countries were reviewed (Seshia 2002).

Questions have been raised, however, about the consistency between India's approach to PVP protection and UPOV, particularly concerning the "farmers' privilege" clause in India's approach which allows farmers to sell saved seeds to others rather than just re-sow seeds saved from their own holding (Yamin 2003). Hence, should it join, India may be asked to revise what may be interpreted as a violation of breeders' rights. Critics allege that the Act is being rushed through with such haste inspite of these concerns 'in response to international pressure and pressure from the powerful commercial plant breeders' (Ramakrishna 2003: 20). The tensions, incompatibilities and creative interpretation of the commitments that the Indian government has agreed to by being party to these agreements support Seshia's claim that

> . . . the emergence and expression of PBRs and farmers' rights in the bill is not simply a cut-and-paste transfer of provisions from international agreements to domestic legislation. Rather, analysis of both provisions indicates that it is instead importantly conditioned by the Indian policy context and the actions and interactions of individuals and groups within India.
>
> (Seshia 2002: 2747)

Further evidence of India's creative approach to domesticating global commitments is found in the approach taken towards IPRs in the Biodiversity Act. The Biodiversity Act provides that inventors making use of Indian biodiversity must seek the approval of the National Biodiversity Authority for any applications for IPRs inside or outside India. The authority can oppose the granting of IPRs outside India on any biological resources obtained within India. Yamin notes that; 'Although the Act has been criticised by some as being unnecessarily bureaucratic and centralised, it is one of the few examples where a developing country has tried to create a framework for benefit-sharing with linkages to its patent system' (Yamin 2003: 42). Whether this ambitious and creative approach will survive judicial scrutiny at the domestic and international level remains to be seen.

Rather like in China, Indian policy across these areas is interpreted by critics as poorly coordinated and incoherent. There is significant overlap between the bodies of legislation, despite the fact that they were produced for the most part by different Ministries. This is the case for example with the Protection of Plant Varieties and Farmers' Rights Bill that the Ministry of Agriculture has drafted, the Biodiversity Bill which the Ministry of Environment and Forests has taken the lead in drafting and the Patent Act which the Ministry of Science and Technology has drafted. Each employing different understandings of property rights, Ramakrishna claims; 'It should be clear that these regimes cannot easily co-exist since they seek to protect the same subject matter but operate on fundamentally divergent principles' (2003: 28).

3.5 Bureaucratic politics

In both countries different ministries within the government have also adopted divergent positions on the trade agreements that the government has signed up to. For example, in India, while the Ministry of Commerce and Industry is largely in favour of stronger forms of patent protection, the Ministry of Agriculture expresses concern about overly restrictive patenting practices. Such moves, argues Secretary of the Ministry of Agriculture, R.C.A. Jain, go against the principles of access and benefit-sharing enshrined in the Convention on Biological Diversity.[28] This position has been supported by groups such as Gene campaign that claims to have organised over 400 meetings in 17 states on issues such as IPRs and in the process 'significantly altered the government's view on this issue'.[29] Their strategy was to hold meetings on farmers' rights and IPR issues in politician's constituencies to maintain pressure on them given that "no-one wants to be seen as anti-farmer".[30] The use of NGOs and farmers movements to bolster positions within inter-bureaucratic wrangles in such an open way is clearly in contrast to the nature of the process in China where such deliberations are kept within government circles, even if appeals are made to other state institutions such as Academies of Agricultural or Environmental Sciences to provide legitimation for particular decisions.

On the Agreement on Agriculture, India's MoA's involvement in inter-ministerial meetings is bolstered by consultation processes with farmers, NGOs and others at state level which are used to claim that MoA represents the rural poor in these debates. MoA professes to be the vehicle for advocating food security and livelihood concerns in the biotech debate and participated actively from 1996 onwards in the debate about the lifting of quantitative restrictions. They have also pushed for "agro-economical" considerations of quality, income and access to play a part in the trials of GM crops overseen by RCGM, to enlarge the scope of the assessments. This commitment to food security and livelihoods is squared with support for India's position on key WTO agreements. In Jain's view, there is no adverse effect on food security of India's membership of the WTO where anti-dumping policies and domestic support policies mean "there is no cause for worry".

Indeed, the view of many within the MoA on biotech, borne out in statements from both Jain and Deputy Secretary of the Department of Agriculture and Cooperation, Dolly Chakrabarty, is that WTO membership could have a positive impact on food security. Rather like in China, there is a strong sense that multinational companies entering India have to do so on terms set by the government. There is little fear, therefore, that policies on biotech aimed at protecting the rights of consumers to know, or to check the "greed and insensitivity" of those multinational companies seeking to "short-circuit" the policy process, will deter potential investors from operating in India. In the case of both India and China, this position seems to reflect a combination of assertive state autonomy regarding rights to determine investor entry on their own terms and a strategic sense that the huge domestic market that potentially exists for

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28 Interview with R.C.A. Jain, Additional Secretary, Ministry of Agriculture, 3 May 2001, New Delhi.
29 Interview with Suman Suhai, head Gene Campaign, 4 May 2001, New Delhi.
30 Ibid.

biotech products in their countries will be sufficient incentive for companies to comply with whatever regulations the government regards as necessary.

Because of the protests generated by India's membership of the WTO, discussed in Section 6, the government has felt the need to involve a variety of civil society organisations in policy through meetings and consultations. Regarding the Agreement on Agriculture, Nitish Kumar, Union Minister for Agriculture, stated; 'In order to prepare our proposals we started a process of wide-ranging consultations at regional level with officials of state governments, farmers organisations, exporters and experts . . . I had met with the farmers representatives, leaders of political parties and voluntary organisations and got their valuable views and suggestions . . . their concerns in this vital sector will be taken into account while we finalise India's proposals for the negotiations'.[31] The sensitivity of agriculture as a sector and concern about the lifting of quantitative restrictions generates great concern amongst farmers groups and government officials in India. The government has attempted to steer a middle course between an unbridled liberalisation strategy and a fall-back position of subsidy use and high levels of protectionism. *The World Trade Scanner* summarises the Indian government's position; 'only the combined benefits of both subsidised agriculture and unimpeded access to developed countries will guarantee food security sufficiently in developing countries and minimise the risk associated with developing country vulnerabilities'.[32]

Similar patterns of inter and intra-bureaucratic politics are also apparent in China, where even within the Ministry of Agriculture, attitudes towards liberalisation in this sector shift between support and opposition depending on the issue and to some extent reflecting the concerns of the state seed enterprises. Such enterprises feel threatened by the arrival of large agrochemical and seed firms that are confident of their ability to out-compete Chinese firms working with lower levels of capacity and producing seeds of lower quality. Their fears have some basis. There is already evidence of the break up of the larger national seed companies in the face of pressures from private companies and traders. At the same time, the multitude of smaller seed firms are being consolidated in order to compete more effectively in the new market environment. The process China is now experiencing is in many ways reminiscent of the turbulence in the seed markets of India following the National Seed Development Policy of 1988.

Overall then, despite different trade policy styles in terms of level of engagement with civil society and distinct political strategies pursued at the international level, both countries have faced significant bilateral pressures around issues such as labelling and patent protection. Each has had to make some adjustments or accommodations, delaying the implementation of proposed measures. But India and China, as relatively strong developing country states, have been able to preserve a degree of policy autonomy regarding the ways in which they implement their global trade commitments. In China's case, obfuscatory and delaying tactics have been the preferred option. In India's case, creative interpretation of the TRIPs agreement, for example, has been a strategy for maintaining choice. Both governments have

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31 *India and the WTO*, Vol 2 No 9, September 2000.

32 World Trade Scanner: BIG's weekly index of changes No.45/08 February 2001 (Delhi: Indian Institute of Foreign Trade).

been accused of lack of transparency, bureaucratic incompetence and policy incoherence. The size of the domestic market in both countries means, however, that threats of relocation to more attractive investment destinations, used to such effect in other developing countries, are less persuasive in these contexts.

4 Biosafety

4.1 Role in the negotiations

In the international negotiations on biosafety both China and India interact closely with the "like-minded" group of which they are a part (Cai 2002; Khwaja 2002). Although China has differences of opinion with the group, on issues around the conditions in which it is acceptable to block the trade in GMOs for example, it continues to align itself most closely with this grouping across a spectrum of substantive issues. Indeed, Cai Lijie from SEPA, (State Environmental Protection Administration) was head of the Chinese delegation and spokesperson for the Like-Minded Group at different points in the international negotiations. He is credited with maintaining a firm stance on issues such as the relationship between the Protocol and the WTO and the importance of adopting the precautionary principle in the agreement in the face of intense pressure from the Miami group.[33] Equally, the Indian delegation played a key role on behalf of the like-minded group in resisting calls from developed countries to omit socio-economic considerations from the text of the agreement (Khwaja 2002: 364).

Both India and China are signatories to the Cartagena Protocol on Biosafety, even though China has not yet ratified the agreement.[34] China's ratification has been slowed by a tussle between SEPA and the Ministry of Agriculture over the extent of their mandates and responsibilities for overseeing the different elements of the Protocol. While SEPA is pushing for early ratification of the Protocol, MoA is seeking overall control over the implementation of the agreement as a condition for accepting early ratification. Ultimately, however, the final decision on ratification of the agreement will be made by the State Council, which sits above the other agencies involved in policy.

SEPA has been the main government agency involved in the negotiations on the protocol,[35] just as the Ministry of Environment and Forests has taken the lead in the case of India. Though leading on the CPB negotiations, SEPA does consult with the Biosafety Office within MoA through a small cross-departmental meeting before each set of negotiations. In the case of India, the make-up of the delegation which attends the biosafety negotiations in departmental terms depends on the primary issues under discussion so that the respective presence of MoEF, as opposed to Agriculture, Commerce and Industry or DBT, can vary, despite a more continual role for individuals such as Dr Khwaja and Dr P.K. Ghosh

33 The Miami group is made up of key GMO exporting countries such as the U.S, Canada and Argentina.

34 China signed the CPB in August 2000. India signed in January 2001.

35 SEPA also hosts the focal point of the Biosafety Clearing House mechanism and co-sponsored the Asia-Pacific regional conference on Biosafety and the Biosafety Clearing House in March 2002 in Beijing.

who have accumulated significant expertise and experience of the negotiation process.[36] It does seem to be the case, however, that MoEF tends to have the final say regarding the make-up of the delegation in advance of an international meeting.

Given the sensitivity of the issue, it is unsurprising that responsibilities for biosafety management are dispersed across government in both India and China. In China, the Ministries of Agriculture, Health and SEPA each have officials dealing with biosafety issues that are meant to work together and exchange information. In practice, however, as one official put in, "rather like the UN", it is difficult to coordinate policy effectively across so many agencies. Each ministry suggests a scientist to represent them on the biosafety committee. The inter-ministerial committee on biosafety, which was set up in April 2002, covers seven ministries in total including those mentioned above and normally meets twice a year though its schedule of meetings is not fixed. India's approval committees for biotech products also have representation from all key ministries (Gupta 2000).

4.2 Bureaucratic politics

Despite the fact that MoA in China has traditionally played a more powerful role in biosafety regulation; covering the monitoring of field trials, import labelling, as well as research and production, some accounts suggest that SEPA may be carving about a greater role for itself within the new biosafety law that is currently being developed. While on many issues there will not be a significant change in responsibilities between ministries, there will be some amendments which mean that SEPA will capture a greater degree of responsibility, and hence secure enhanced resources for overseeing implementation of the CPB. A bureau made up of 13 departments and ministries is carrying forward the process of designing a new biosafety law at the moment,[37] a draft of which is expected by October 2003. It is intended that the new law will surpass all existing biosafety policies and be broader in its coverage. Officials within SEPA hope that the law will magnify the effect that the CPB has had to date in shifting the balance of the debate in China towards biosafety concerns, raising the profile of the issues that SEPA has been working on. As one member of the Chinese delegation to the biosafety negotiations put it; 'A positive impact of the Biosafety Protocol in China has been that other ministries pay more attention to biosafety issues than before'. In this regard, SEPA officials hope that the new law will mirror many of the key provisions of the CPB.

These bureaucratic battles are also manifest at the interface between science and policy. The MoA biosafety expert group is primarily responsible for risk assessments of applications on a case by case and province by province basis. A range of experts from bodies such as the Chinese Academy of Sciences and the Institute of Botanical Research sit on these committees, though some indications are that up to 80 per cent of the members of the committee have biotechnology backgrounds while only 20 per cent are ecologists, reflecting a bias common to many regulatory systems, including India's, towards those more

[36] Interview with Dr Babu, MoEF, 30 March 2001.
[37] Twenty departments will have to sign off on it.

likely to be in favour of biotech development than those more familiar with the environmental risks associated with the technology. This profile may also reflect the fact that the Chinese Academy of Environmental Sciences, from which SEPA draws its expertise, is less influential and qualified in these matters than the Chinese Academy of Agricultural Sciences which works closely with the Ministry of Agriculture. Nevertheless, despite some objections, there is evidence of a prevailing consensus in favour of the precautionary principle as a guide to risk-based decision-making.

Government officials claim to draw on elements of a variety of different approaches adopted by countries such as the US, Japan and the EU as well as international institutions such as the OECD and Codex Alimentarius in the design of their own risk assessment processes. This is similar to India, where risk assessment guidelines have drawn upon models used by the US Department of Agriculture, Plant and Animal Health Inspection Service (APHIS) as well as from biosafety guidelines elaborated by other OECD countries. One key difference in India's case is a requirement, added to the 1998 Biosafety Guidelines, that safety assessments include an agronomic evaluation of a transgenic crop to determine it's economic advantage to farmers (Gupta 2000). How India will square its commitments to sound science and precautionary decision-making with an assessment of socio-economic considerations is currently unclear. The ambiguity surrounding these concepts and the latent tensions between them that derives from the CPB, is in many ways reproduced at the national level through India's biosafety system. Even areas of policy that are fairly tightly proscribed in the CPB can be subverted by bureaucratic politicking. Just as risk assessment procedures in China are subject to fierce bureaucratic in-fighting over respective responsibilities, so Gupta notes that the impetus for India's demarcation for contained use appears to be the need to ensure that the RCGM maintains control over field tests and biosafety evaluations of transgenic crops (2000: 25).

Rather like in India, where there are tensions between DBT and MoEF over how to strike a balance between promoting biotech and protecting against some of the risks implied by its development, in China the Ministry of Science and Technology (MoST) plays a key role in promoting biotechnology through funding public research and helping public-private commercial ventures such as BioCentury, while SEPA has primary responsibility for managing the environmental impacts of the technology's development. According to critics of the process, the fact that 'MoA trumps SEPA most of the time' is explained by the priority the government attaches to the function of biotech promotion over protection. Evidence for this is provided by the fact that funding for biotech promotion vastly outstrips that provided for biosafety assessment in the 863 programme for example. The balance may also be tilted towards biotech promotion over biosafety concerns by the incentive structures that exist within government that serve to speed the approval process. Pray notes that the Chinese regulatory system is 'susceptible to political and economic pressure especially since regulators now have to earn part of their income through commercial activities' (1999: 52). This means that 'Regulators need enough government financing so that they do not need to be involved in commercial enterprises with the firms they are supposed to regulate' (ibid).

It is important though to probe beyond inter-departmental conflicts of interest and the clashing mandates over biosafety regulation in order to make sense of these contests over how to domesticate

global policy. There are divisions within the key ministries, such that the biosafety office within MoA is said to be pushing for stronger forms of biosafety regulation and even within MoST there are some individuals sympathetic to these concerns. Equally, on the issue of restrictions on foreign investment in biotech in China, the biosafety office within MoA is opposed to the rule, despite it's own former seed division expressing support for something similar three years earlier. Hence, while John Killmer of Monsanto claims; '[China] have one foot on the accelerator, which is funding biotech research and development, and they have the other foot on the regulatory brake' (ibid), it is clear that these apparent inconsistencies reflect genuine differences of opinion between government ministries and even between departments and individuals within ministries that attach different priority to biotech development, as opposed to biosafety protection. This apparently "schizophrenic" position is a function of different departments reacting to different realities and pressures from constituencies including international institutions, which in turn pull the government in divergent directions, the private and public commercial sectors, each with their conflicting preferences, and the large agricultural sector of scientists and farmers with a clear stake in the debate. As was noted in the section on trade liberalisation, individual policy-makers are embedded to different degrees in policy networks that both shape their positions but also bolster them within bureaucratic power struggles. Policy stances only appear schizophrenic therefore if we assume that the government should, or indeed can, operate as a cohesive unit.

These competing bureaucratic mandates and positions undoubtedly serve to slow the approval process for GM crops, however, as each department and ministry seeks to ensure that the issues it is responsible for have been properly addressed. Just as with the labelling debate, concerns have been expressed by foreign firms and the trade officials that so often speak on their behalf, that the approval process in both India and China is too fragmented and incoherent, dispersed across too many departments whose precise roles in the process are poorly defined. In India, this has led to demands from prominent industry groups such as the Confederation of Indian Industry and the All India Biotech Association for a consolidated one-stop approval process (Newell 2003a). US trade officials have made a similar request to Chinese regulators, expressing their preference for a single agency mirroring their own FDA (Food and Drug Administration) that would deal with all approvals.

4.3 Enforcement

Beyond the process of translating global policy commitments into national policy amid these competing pressures, just as we saw with labelling above, there are questions about the practical enforceability of biosafety regulations. In India in 2001, it was found that *Bt* cotton had been grown in Gujarat and many other states, having been supplied by the company Navbharat Seeds that distributed the seed without government approval. Micro-managing the seed trade with high levels of government control is almost impossible in large developing countries such as India where seed markets are heavily de-regulated. A representative of the Karnataka Seed Association stated frankly 'There are hundreds of seed sellers in Karnataka. Regulation is an impossibility' (Scoones 2003). There is also evidence of the illegal growing of *Bt* cotton in the Yangtze Valley in China. One official from the Ministry of Agriculture conceded that

when the area was opened up it was found that the Yangtze valley 'was 40 per cent plus insect-resistant cotton already'. Huang Jikun puts this down to the fact that farmers are not waiting for permission to grow *Bt* cotton because of the benefits they expect to gain from growing the crop (SiliconValley 2002).

Governing the transboundary movement of GMOs, as required by the CPB, also makes unrealistic demands of over-stretched and under-trained customs and quarantine officials in developing countries. Greenpeace have pointed to the ease with which imported soya, for example, can be grown illegally in China, despite claims that most of it is ground down.[38] Their fear is that a situation similar to that in Brazil could unfold where seed smuggling and illegal growing have undermined the credibility of the government's strategy of simultaneously producing GM and non-GM crops in different parts of the country without cross-contamination or seed mixing. This could scupper plans to develop the North-East of China, in provinces such as Yunnan, as a GM-free soybean producing area to meet demands from Japan, South Korea and Europe for GM-free products, discussed above.

In both countries there are concerns that equipment and training are insufficient to fulfil international obligations to oversee the trade in GMOs with any degree of scrutiny or effectiveness. SEPA in China concedes; 'there is a lack of safety management measures addressing the export, transportation, commercialisation, storage, use and waste disposal . . . national capacity for biosafety management is rather weak' (SEPA u.d: 27). In addition, despite notional responsibilities that district and state administrations have in India or the GMO detection agencies that have been set up at county and prefecture level in China,[39] capacity is lacking and most key decisions continue to be made in the capitals of the two countries. This is true for decisions on the nature of trials and whether or not products will be approved, for example. Hence, while province level governments in China are allowed to strike deals with foreign investors in some sectors, for seeds and GMOs, all applications have to go through central government given the sensitivities surrounding the subject. This is despite the fact that bureaus of agriculture at province level have to support a company's application for safety approval to the central government. This contest of authority reflects the "dual control" between centre and province that characterises environmental policy in China (Sinkule and Ortolano 1995: 5). In India, there have been complaints about the arrogance of the central government in Delhi making approvals for the trial of crops in states without consulting officials in those states. The Minister of Agriculture for Karnataka claimed he only learned of the approval of trials of MMB's (Mayhco-Monsanto Biotech India) *Bt* cotton through the media (Scoones 2003). A state biotechnology committee was set up only after the tests were well underway (Gupta 2000).

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38 Greenpeace interviews, Beijing, 7 April 2003.

39 For example training has been undertaken by MoA at prefecture and county level for 21 research stations for them to become GMO detection agencies. Officials at these levels are also responsible for submitting reports to local government officials who collect data on trials taking place. Having reviewed the data, however, it is still national level agencies that issue approval certificates.

With the domesticating of biosafety policy then, we see many similarities in the experience of India and China. Each has allowed environment bureaucrats a relatively free reign in the global negotiations on biosafety, but at the stage of interpretation and implementation, bureaucratic in-fighting has given rise to battles over the weight given to different elements of the Protocol, which relate in turn to competitions over mandates and their resource implications. Both also face common problems of the non-enforceability of biosafety regulations and the ungovernability of the seed trade, within their countries as well as across borders. Unresolved questions remain in both cases, as with many other countries, about how commitments to trade liberalisation in the agricultural sector can be squared with the use of biosafety regulations to restrict the trade in GM seeds.

5 Role of the private sector in domesticating global policy

5.1 Access and contestation in India

To a greater extent than in China, biotech companies, large and small, as well as seed enterprises have been actively involved in the design, development and enforcement of rules and laws on biotechnology, biosafety and patent protection in India. In order to influence decision-making processes around these issues, they have formed into associations and industry umbrella groups such as the All India Biotech Association or channelled their concerns through long-standing bodies such as the Seed Association of India or the Confederation of Indian Industry (Newell 2003a). These bodies have pursued a number of strategies to ensure that global commitments are "domesticated" in ways which reflect their interests and concerns.

While the potential for growth and employment that agricultural biotechnology could bring to the economy is hotly contested in India, the prevailing perception amongst policy élites within government is that biotechnology can realise that potential, reflected in the pronouncements of the Indian Prime Minister and senior officials within his government, cited above. This perception is endorsed and encouraged by media-based and business narratives, but its acceptance is also a function of the social networks that bring commercial and policy élites together which help to nurture this consensus (Newell 2003a). Some companies and associations clearly wield more power than others, but larger firms have been able to present the interests of their particular fraction of capital as consistent with those of capital in general. Such strategies help to fuzzy any distinctions that may exist between notions of what is in the national interest and what is in the interest of leading firms. While it is difficult for many firms to make this claim successfully, for biotech companies operating in India, the simultaneous potential for high returns, global market penetration and the prospect of addressing some of India's food security needs, places them well to argue that their commercial interests coincide with those of the national interest.

While access to skilled labour and adequate infrastructure place constraints on where firms can locate, large biotech firms consider themselves to be highly mobile in where they base themselves. This provides them with a degree of leverage over governments anxious to attract investors where they can

exercise a powerful threat to move operations elsewhere. The competitive race with China has been invoked by bodies such as the Confederation of Indian Industry, as well as individual firms, to steer a regulatory course sympathetic to industry concerns. Quotes from government officials such as P.K. Ghosh testify to the extent to which these fears have been internalised.

The fact that these concerns bear heavily on policy-makers in designing policy instruments to meet global commitments is, in part, explained by the degree to which biotech companies have been directly engaged in the policy process. Leading biotech firms in India have been able to secure access to committees and key government departments involved in policy-making on biosafety issues. Accounts of the nature of industry involvement in the design of biotech regulations differ, however. Despite activist claims that DBT essentially operates as the mouthpiece of multinational biotech firms, many firms are damning of the delays in the approval process which they put down to DBT stalling because of its over-cautious approach to biotech. This, for some firms, is manifested in the broad range and questionable necessity, from their point of view, of some of the tests they have to undertake to assess the biosafety of their products. Many such studies on pollen flow, or effects on cattle are deemed to be "irrelevant", resulting from bureaucratic imperatives to ensure that the regulations are seen as legitimate and to be seen to be doing something. There is a suspicion on the part of some biotech firms that businesses whose core investments are in pesticides and chemicals and with whom the government traditionally has enjoyed a close relationship, are using fears about biotechnology applications to slow the growth of the industry as it competes directly with their potential share of the market. In reality, the fact that cotton is the first crop to go through the system may explain the protracted nature of the process on this occasion.

In addition, despite industry protestations of lack of consultation over the design of regulations, a more plausible explanation is that while they enjoy close relations with some parts of government, this is not the case with all government departments. For example, while relations with departments such as commerce and industry are good, biotech firms have been less successful at getting a sympathetic hearing for their concerns with the Ministry of Environment and Forests. Firms that belong to CII and AIBA have been strongly supportive of common approaches to risk assessment and the use of principles such as substantial equivalence and familiarity, reflecting their ties to global industry groupings such as the Biotechnology Industry Organisation (Newell 2002). They have been unable to persuade environment bureaucrats of the merits of approaches to regulation that are minimally disruptive of global trade, however. While there is some acceptance among government bureaucrats of the value of standards on risk being set internationally and there exists some support for "mutual recognition" of other countries risk assessment procedures, there is reluctance among MoEF representatives to 'rely on trials from the US and Europe' as a basis for approving crops in India.[40] Moreover, whilst also acknowledging that 'things only happen when industry pushes',[41] MoEF officials are critical of the intensity of industry lobbying on this issue. Given this, it is perhaps unsurprising that NGOs go to MoEF first, rather than these other

[40] Interview with Dr Indrani Chandreshek-Laran, 29 March 2001.
[41] Ibid.

ministries and departments that are considered to be more receptive to industry positions on the issue, such as DBT and the Ministry of Commerce and Industry.[42]

It is also the case that industry criticisms of the approval process should not be confused with the close ties that exist between leading firms and senior government officials within DBT. P.K. Ghosh, former Advisor to DBT, in particular, was lambasted by the Delhi press in 1998 over allegations of collusion with Monsanto-MAHYCO and by activists for his over-zealous approach to endorsing the technology without due regard for the procedures set up to approve GMOs. Those involved in decision-making on the RCGM and GEAC committees comment on the way in which 'Ghosh speeds the process up' by bundling together a series of requests for approval.[43] This haste, however, has resulted in Vandana Shiva bringing a case before the Supreme Court of India contesting the authority of the body that approved trials of the controversial *Bt* cotton crop (RFSTE 2002).

In terms of the committees responsible for approving biotech products, such as the RCGM and GEAC, critics also allege a pro-industry bias in the selection of scientists that sit on the committees to the exclusion of critics. Scoones (2003) notes that the RCGM is overwhelmingly dominated by molecular biologists amongst whom there are high levels of consensus on the benefits of the technology. A similar allegation is levelled at the government over the consultation process that takes place regarding proposed amendments to biosafety regulations where a relatively closed and supportive group of researchers and NGOs are invited to comment on proposals, rather than a wider circle of critics.[44]

Just as activists such as Vandana Shiva and compatriots draw on global networks of allies to contest the ways in which the government of India goes about meeting its global obligations (see Section 6), firms also use their connections to global coalitions to push domestic policy in a direction that accommodates their interests. The Seed Association of India, for example, interacts with counterparts at the international level through the International Seed Federation.[45] Leading Indian companies in the sector such as Indo-American help to forge these connections where the company's director, Dr Manmohan Attavar, sits on the Executive Committee of the International Seed Trade Federation (FIS), now part of ISF. Through being part of a global seed industry association, SAI and its members also come to be involved in global public debates which touch upon their interests. This would include, for example, debates about the additional costs associated with the trade in GMOs that may derive from both the CPB and its Advance Informed Agreement (AIA) and notification requirements and national and regional legislation on labelling and traceability.

To a greater degree than either the SAI or AIBA, CII are very active in international policy debates on biotech issues working with groups such as BIO (Biotechnology Industry Organisation) and the Global

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42 Interview with MoEF officials, New Delhi, 29 March 2001.
43 Interview with RCGM or GEAC member, 3 April 2001.
44 Interview with Indian activist, August 2002, UK
45 The International Seed Federation resulted from the merger in 2002 of the International Seed Trade Federation (FIS) and the International Association of Plant Breeders (ASSINEL).

Industry Coalition, as well as with counter-parts in South Africa and Europe.[46] The policy positions adopted by CII, embodied in their White Paper on biotechnology, resonate strongly with the line espoused by BIO with regard the need for "sound science", WTO-compatible regulation that is restrictive of the use of socio-economic criteria as a rationale for restricting imports. These arguments have been used to contest the inclusion in India's regulatory system of a requirement that crops are evaluated for their agronomic potential. From the point of view of bodies such as BIO, not only do bodies such as CII play a key role as transmission belts for the regulatory preferences of global biotech firms, but the credibility of the organisation as a "global" body representing industry the world over is enhanced by links to southern industry bodies (Newell and Glover 2003).

Groups such as CII also play a key part in preparing the ground for Indian firms to capitalise on investment opportunities created by WTO agreements on agriculture, investment and intellectual property rights. For example, CII and the US-India Business Council launched the Indo-US Biotech Alliance in November 2002. The alliance is part of the US-India Economic Dialogue launched by Prime Minister Atal Bihari Vajpayee during his visit to the US in 2001 aimed at improving investment opportunities and business cooperation in biotechnology.[47] CII has also undertaken its own "biotech missions abroad" and is organising the first "Made-in-India" show in Beijing in October 2003 where biotech will feature highly.[48] CII see these visits as key to offset the image of India as a hostile investment environment for biotech firms. In playing this promotional role, CII has been at the forefront of persuading GoI to provide tax breaks for investors in research and development and for patented products,[49] lowering duties and creating attractive infrastructures, following the model set by the information technology industry. While the government plays the main role in negotiating the terms of trade agreements in these areas, firms play a key proactive role in advising on the policies and measures that they believe will help the country to realise the fullest benefits from trade liberalisation, based on their regular interactions with overseas investors.

5.2 Playing by different rules in China

While the situation is somewhat different in China, in terms of the way in which firms engage the policy process, the level of commercial interest in biotechnology is, if anything, heightened. Many multinational companies view China as a large potential market for GMOs. Among them are Monsanto, Du Pont and Pioneer and from Europe, AgrEvo and Syngenta (Ma 1999). Different firms have demonstrated varying degrees of commitment to the development of biotech in China with Monsanto having most at stake. The most high profile foreign biotechnology sold commercially in China is Monsanto and Delta and Pine Land's cotton which was planted commercially for the first time in 1998 in Hebei province (Pray 1999).

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46 Interview with K.P. Nyati, Head Environmental Management Division, CII, Habitat Centre, Delhi, 1 May 2001.

47 'Indo-US biotech alliance launched to boost fund flow', *Business Line*, 9 November 2002: 4.

48 'First made in India fair in Beijing in October next' *Financial Express*, 9 August 2002: 9.

49 'Biotech sector seeks tax sops' *Business Standard*, 19 February 2003, p3.

This is in contrast to a company like Du Pont, for example, which imports genetically-engineered soya into China while also purchasing non GM soya protein facilities. Other companies, such as Pioneer, have entered into partnerships to produce hybrid maize seed, while for firms such as Syngenta,[50] biotech is not prominent within their overall portfolio of activities in China,[51] maintaining instead strong interests in pesticides and conventional (vegetable) seed trading. While there is some competition between the firms over cotton and corn, Monsanto is acknowledged to have derived a key comparative advantage by being first into the market in China. Nevertheless, the size of the market in China makes it worthwhile for companies to persevere in capturing even a small part of the enormous potential market that exists for their products.

Most private investment that has taken place to date in China is from foreign firms through joint ventures or research work with public institutions. For example, Monsanto has initiated a research programme with several Chinese wheat research institutes to develop hybrid wheat, conducting tests in 1998 with eight institutes (Dunphy *et al.* ud). Delta and Pine Land also had a collaborative research programme with the Cotton Research Institute of CAAS (Chinese Academy of Agricultural Sciences). Foreign firms typically collaborate with local firms as Chinese law requires them to have a local joint venture partner and only certain types of state owned enterprises can sell the seed of the major field crops (Pray 1999:48). In the example given above, Monsanto and Delta Pine Land established a joint venture with the Hebei Provincial Seed Company to sell transgenic cotton seed. The new joint venture company, Hebei Jidai Cotton Seed Technology Company Ltd, is the first cotton planting seed joint venture in China formed with foreign investment in cooperation with the People's Republic of China. Delta and Pine Land China owns two-thirds of the new joint venture and one-third is owned by the Herbei Province investor (SeedQuest 1997). The venture followed an earlier attempt by Monsanto to seek approval for *Bt* cotton through the central government in 1990. Adopting a slightly different strategy, Pioneer has set up a 100 per cent owned research company, but as Pray notes, the company 'will have to join with one or more government seed companies once it is ready to commercialise its products' (1999: 51). Joint ventures and collaborations continue to be restricted by weak forms of intellectual property protection, from the point of view of private firms, which makes them reluctant to work with state-owned enterprises for fear of loss of control of proprietary technology (Pray 1999; PANNA 2001).

Besides the large foreign entities, rather like in India, there are a number of smaller "start up" biotech companies headed by entrepreneurial scientists from the public sector. The difference in the case of China is the strong degree of government financial support for firms such as BioCentury, which are effectively public-private enterprises, whereas in India firms such as Strand Genomics or Avesthagen have to rely on volatile venture capital funding for support for their work (Newell 2003a). Government programme 863, the platform of China's biotech development, is explicit in its vision to nurture Chinese biotech firms such as BioCentury that will ultimately be able to compete independently against the likes of Monsanto. This is

[50] Syngenta is the company that resulted from the merger between Novartis and Astrazeneca.

[51] Syngenta is currently only testing *Bt* cotton at this stage. The company also maintains a programme on GM rice.

done by encouraging companies and institutions to collaborate, providing companies with a legal title and allocating government research funds to companies to conduct basic research (MoST 2001: 15).

It is against this background of explicit state support for national biotech enterprises that foreign firms operating in China have to adapt their political strategies to the accepted channels of engagement in China. Open lobbying, use of media channels and party donations are clearly not an option in China. However, despite the difficulties of forming formal associations, firms do meet to pool expertise and form common positions which they present to government. There are China offices of groups such as CropLife International and the Crop Protection Association which have a sub-association of members principally working on biotech which includes Monsanto, Bayer, Du Pont, Dow and Syngenta. The group has, in the past, submitted position papers to the government, though these have not been responded to. Whilst some verbal lobbying is possible, and has been used by firms, for the most part there are few channels or openings for formal inputs into the policy process. While the expertise of firms on certain implementation issues, such as the interim measures for example, is welcomed, for the most part their opinions are not sought as in India.

It is China's import and investment regulations that have drawn most ire from industry and government trade officials. It was these rules in particular that prompted the US trade mission led by President Bush to meet with, then Premier, Zhu Rongji. On 1 April 2002 China's 'Catalogue for the Guidance of Industries for Foreign Investment' came into effect which included a set of rules prohibiting foreign companies from investing in GM crop development and the seed business. Although the joint venture operations of Monsanto and other biotech majors in China are unaffected by the regulations, John Killmer, President of Monsanto China said; 'China has imposed the most restrictive regulations of the production, research and importation of GMO crops in the world' (Dow Jones 2002a). The suspicion is that the restrictions were an attempt to protect domestic biotech companies against competition from stronger biotech multinationals. Behind this concern is the belief that China is exploiting international worries over genetically modified food to circumvent its World Trade Organization commitments to open up its agricultural sector to foreign competition (Dow Jones 2002a). Prominent biotechnology advocate, Robert Paarlberg, suspected that 'the genetics issue is just an excuse to control trade' (NGIN 2002).

The fact that some individuals involved in setting these regulations themselves have interests in Chinese biotech companies such as BioCentury may add fuel to the claims of discrimination against foreign capital. One industry spokesperson said; 'The problem is that on the biosafety committees, the referees and the players are the same people'. Keeley (2002) cites the case of an individual who holds a senior position within the company Biocentury but is also a key member of the committee in the Ministry of Agriculture that makes recommendations on applications for trials, release and commercialisation of biotech crops. The fact that scientists with their own commercial interests that sit on these committees are keen to block products from foreign competitors is confirmed by other individuals on the approval committee. While government officials claim that when applications in which committee members have a stake are being assessed the individuals concerned are excluded from the decision-making process, industries complain nevertheless that the barriers to approval are raised for foreign firms.

A representative from Monsanto suggested, for example, that while large data requirements were imposed on Monsanto's *Bt* cotton variety, local producers were only expected to provide a few pages of data. Hence while Monsanto has consistently been refused biosafety approval for its *Bt* cotton variety in the Yangtze provinces, Biocentury was given permission to commercialise its *Bt* cotton in the Yangtze province of Hubei. Alleged differences between the varieties that are said to account for the reduced biosafety risks of BioCentury's seeds, that were invoked to defend the decision, are highly disputed (Keeley 2002). It is also alleged that MoA intervened to ensure that cotton was removed from the list of protected varieties under China's PVP legislation in order to enable Chinese firms to replicate and profit from Monsanto's seeds. On this issue Smith argues, 'China is trying to make sure that the lax protection of intellectual property rights and a selective approval process keep competitors in check while domestic companies have freer rein' (2000: 2).

For Monsanto, these delaying tactics are clearly intended to allow local producers to get their products to the market first, reflecting government officials' fear that Monsanto could become a monopoly force in China. Non-industry voices also suggest that patterns of discrimination against foreign investors reflect the fact that China wants to develop its own nationally oriented and more autonomous biotechnology strategy. According to one western diplomat; 'if China can become a leader in biotech development without foreign involvement, it will be a matter of pride, a national achievement, a high-tech sector that's theirs' (Dow Jones 2002a).

Monsanto has claimed that extensive rules on research, production, food processing and the trade in GMOs will be to delay the commercialisation of the company's *Bt* corn by about a year. Commenting on the repeated rejection of the company's *Bt* corn over the past few years, John Killmer, President of Monsanto China said; 'I believe that in general there is administrative and government guidance not to approve insect resistant corn' (quoted in SiliconValley 2002). The company alleges that each time they seek approval for the crop, another test phase requirement is added in order to deny approval. Essentially, an extra step has been added to the approval process. Whereas previously GM crops had to pass lab tests, pilot field tests and go for environmental release before commercialisation, now there is an additional step of a production trial before mass production. David Shi, Monsanto's government and public affairs director in China claims that the process of completing production field tests and getting state approval for applications could take 270 days (*Financial Express* 2001).

But while companies have been quick to complain about this time-frame, it is exactly the length of time specified and permitted in the Cartagena Protocol on Biosafety. Hence whilst traders may feel that they are subject to undue delays in the approval process, by invoking this time frame the Chinese government is only enforcing its rights under an agreement which the US, for example, has not signed. Countering the claims unreasonable discrimination, Ms Fang Xiangdong of the Scientific Research Planning Office under the Ministry of Agriculture argues that; 'All foreign biotechnologies have to be approved by China's safety committee on Agricultural Genetic Engineering . . . we've no bias whatsoever against foreign technologies so long as the companies have certification from their own countries' (quoted in Ma 1999). Agriculture Minister Du Qinglin was also quick to emphasise that 'Import controls are not

aimed at any one country or any one product' (Blanchard 2003). In addition it remains the case that Monsanto, despite its protests, has already gained approval from the government to grow *Bt* cotton in the eastern provinces of Hebei, Anhui and Shandong and is awaiting permission to plant in Hubei and Henan (*Financial Express* 2001).

On the issue of conflicting interests, the overlap between technology developers and technology regulators that we see in the case of China is also apparent in India and is a problem common to many, particularly developing countries, where expertise is concentrated in a relatively small number of highly trained individuals. Gupta notes in the India case '[the] two central committees . . . are composed of public sector scientists who are themselves engaged in transgenic research. This results in the not unfamiliar situation of scientists regulating themselves' (Gupta 2000: 16). Hence what is constructed by foreign companies as anti-competitive behaviour, may also be the inevitable consequence of the same individuals being cast simultaneously as researchers, entrepreneurs and regulators. Scoones suggests, however, that public sector scientists, from the Indian Centre for Agricultural Research (ICAR) for example, with their own commercial ventures in biotechnology, have also played a "blocking" role, attempting to prevent the release of Monsanto varieties in preference for their own. He notes

> *Bt* cotton was under development in the ICAR system at the Cotton Research Institute at Nagpur, at IARI in Delhi, at Tamil Nadu Agricultural University in Coimbatore and at Dharwad in Karnataka. The Ministry of Agriculture was represented by ICAR on the GEAC, and some of the delays and requirements can possibly be seen in this light. As one senior university scientist involved in DBT committees put it: 'If developed by Indian scientists, transgenics may have seen the light of day much earlier.
>
> (Scoones 2003)

What separates the two country experiences perhaps is the degree to which Chinese entrepreneurs with access to government committees have been successful in denying market access to products from competitors, whereas their Indian counterparts were only able to introduce delays. This may be explained by the greater threat that foreign seeds are thought to pose to domestic producers in China and the unequivocal support that the Chinese government has leant to their own biotechnology firms as part of a more nationalistic vision for technology development.

We see then two contrasting styles of engagement with the private sector with important implications for state autonomy and the weighting that is given to the expressed concerns of national and global biotech capital. In the Indian case, there are a series of well organised industry coalitions with multiple formal points of access and informal arenas through which preferences can be articulated. The higher profile of the private sector in India and its strategic importance to the overall health of the Indian economy, means that the preferences of globally mobile capital, represented to government through bodies such as the CII, have to be taken seriously. The Chinese government, by contrast, has not sought to engage the private sector in its deliberations about how to reconcile its' WTO obligations with its

commitments under the CPB. The interventions of foreign leaders, on behalf of global firms, have played a far more significant role in shaping the way in which policy commitments are interpreted. A strongly nationalist approach to supporting Chinese biotech entrepreneurs has also provided an important steer to decision-making about China's place in the emerging global political economy of biotechnology.

6 Role of civil society in contesting policy

The links between organised civil society within India and China and the international agreements discussed in this paper operate at many levels. Article 23 of the Cartagena Protocol on Biosafety calls on governments to involve the public in decision-making about the design of their national biosafety frameworks through public participation, consultation and education and awareness-raising. Governments have interpreted this commitment in a variety of different ways (Glover *et al.* 2003), but provisions such as this have the potential to create spaces for organised civil society stakeholders to influence national policy on biosafety. The case of China also illustrates their limits, however, where aside from "internet discussions" between policy-makers and the public, most "consultations" have taken place within government. Liberal understandings of the practice of democratic politics, contained in agreements such as the CPB, carry little resonance among government officials in Beijing and the sanctions that reside with the secretariat of the Protocol on Biosafety to penalise non-compliance with particular articles are weak and rarely applied.

Civil society groups in India and China have, however, benefited from the debates and protests that have been sparked in other regions, such as Europe for example, which have provided them with leverage to initiate discussions in their own societies about what forms of biosafety regulation or trade strategy are viable in global terms. Connections to global NGO players such as Greenpeace and GRAIN have also helped to support the domestic campaigning work of groups in India and China. The activist list "AgbioIndia" hosted by the Indian group *The Forum for Biotechnology and Food Security* and the newsletter "International Biosafety" co-published by Greenpeace China contain many biotech stories from the world's media, which in turn, are often derived from NGOs in those countries. They provide a route to publicise concerns about GMOs without, in the case of China, being seen to criticise government action directly. The connections also run the other way, where activist groups in the North can help to validate claims about the "global" rejection of GM crops through reference to the work of their counterparts in India and China.

While, in general, the role of civil society groups in shaping policy in China is considered to be weak, one particular episode serves to discredit the assumption that civil society is a redundant actor in the politics of biotechnology in China. Greenpeace China became involved in a public debate, fuelled by high levels of media coverage, over the environmental impacts of *Bt* cotton being grown in China (Greenpeace International 2002). A report by Professor Xue Dayuan from the Nanjing Institute of Environmental Sciences (Jiangsu province) and advisor to Greenpeace came to the controversial conclusion that

> After five years of growing, Chinese farmers and scientists are now faced with serious problems and confronted with the fact that too little is known about the interaction of GE crops with the environment. High hopes have been crashing down and reality shows that the information from the GE industry has been unsubstantiated.
>
> (ibid)

What increased the impact of the report was that it was produced for Greenpeace by a state research institute under SEPA, the Nanjing Institute of Environmental Sciences. The study received coverage in the *China Daily* newspaper and so forced government officials to react to the claims and defend the record of *Bt* cotton in China. Government scientists from the Chinese Academy of Sciences were assembled to refute the claims made in the report, including the director of China's Centre for Biosafety Research Peng Yufa who said to reporters; 'Greenpeace is absolutely ignorant about genetically modified cotton and doesn't know how to protect the environment' (Kyne 2002).

Interesting from the point of view of a comparison with India, is the way in which the study's findings about the negative environmental impact of *Bt* cotton were picked up by activists in India to challenge their own government's acceptance of *Bt* cotton for commercialisation. Devinder Sharma, Chair of *The Forum for Biotechnology and Food Security* in a commentary on the study argues

> The DBT, the Indian Council for Agricultural Research (ICAR) and the Maharashtra Hybrid Seed Company (Mahyco), which is collaborating with the seed multinational Monsanto, has always used the example of China to push in an untested and environmentally-risk genetically modified technology' . . . Following the admission by Chinese scientists that *Bt* cotton is damaging the environment, the Forum for Biotechnology and Food Security . . . has called on the Prime Minister to institute a high-level enquiry into the dubious role of the Department of Biotechnology and Ministry of Science and Technology in supporting, promoting and hastily pushing the controversial modified crops onto gullible Indian farmers.
>
> (Sharma 2002)

Greenpeace China was also involved in another controversial episode, though this time its claims did not run counter to government policy. Rather than attacking the Chinese government's approach to the development of Patent Laws, Greenpeace targeted what they referred to as Monsanto's "Biopiracy Plans". The allegation was made regarding Monsanto's alleged interest in patenting wild and cultivated varieties of soybean, a patent that would 'grant the company an exclusive right on soy plants, their seeds and progency with high yield traits'. Though the patent application was filed simultaneously in over a hundred countries, including the US and countries in Europe, the group's particular objection in the Chinese context, was the large scale consequences the patent would have in a country where 90 per cent of the world's wild soya is growing and which is a centre of diversity for the crop (Greenpeace 2001). While Monsanto claimed that it was pursuing a patent for the technology only in the US, Greenpeace argued that Chinese exports would be affected and that farmers will live with the risk of patent infringement which may be pursued under

WTO rules. The Greenpeace claims attracted front page coverage in the critical Chinese newspaper *Southern Weekend,* which claimed that Chinese farmers unwittingly ignoring a Monsanto patent 'might make it impossible to export some Chinese soy products and could even result in international trade sanctions' (Kurtenbach 2001). The timing of the story, just before China's formal entry into the WTO, led the State Council to instruct MoA and SEPA to look at the issue in more detail. [52] Hence, although the application was made in the US, according to Kurtenbach, the episode 'reflects a growing awareness of intellectual property issues in China and their bearing on the country's fate as it opens its markets and moves into the World Trade Organization' (Kurtenbach 2001).

Despite the apparent impact of these campaigns, it is nonetheless difficult for Greenpeace to operate in China. The group's main office is in Hong Kong and the Chinese group, which is only two years old, exists as a contact point working through local NGOs and with academics in order to preserve a legitimate presence in China. The group's activities are primarily targeted at consumer education and disseminating global news about biotech issues within China through the group's *International Biosafety* newsletter. The group have also funded the production of public opinion surveys in selected provinces aimed at gauging public acceptance and attitudes towards GM crops (Greenpeace China u.d). Essentially, however, biotech is viewed by Greenpeace as a useful entry point to a broader public debate about the future of agriculture in China. Direct engagement with policy-makers or the use of institutional channels in order to try to shape the domestication of global commitments is effectively a non-option in the Chinese context. It is almost certainly the case then that the Chinese government, in mediating these potential conflicts and trying to strike a balance between the promotion of biotechnology and ensuring adequate biosafety protection, faces less opposition than the Indian government. Smith, perhaps exaggerating the case, argues

> There is no public debate to stir up the opposition that brought the development of genetically modified crops to a near standstill in India. Chinese scientists are derisive about Europe's resistance, which has already made China stop exporting genetically altered tobacco and soy sauce made from American genetically altered soybeans.
>
> (2000: 3)

This is in spite of government claims to be making strenuous efforts to engage the public in a debate about biotechnology in China. Keeley cites a *China Daily* report on 16 August 2001 which claimed

> China is making progress in making democratic and scientific decisions when the outcome concerns the immediate interests of the public. The government has used many methods to listen to people's opinions through public opinion polls, open debates and discussions. Introducing these methods in science-policy making is under discussion. Debates have been organised in newspapers and TV on

[52] Greenpeace interviews, Beijing, 7 April 2003.

biotechnology and social and moral principles so that scientists, sociologists and the public can exchange their opinions directly.

It is also easy to caricature the extent of civil society influence on biotech policy in India (2002: 16). Recent developments, such as the commercialisation of *Bt* cotton, suggest the limited potential of civil society in India to resist the development of biotechnology, even if groups have enjoyed some success in stalling the approval process and contesting the effectiveness of the regulatory system. For example, the group Research Foundation for Science, Technology and Ecology filed a writ petition with the Supreme Court of India challenging the legality of decisions on open field trials (RFSTE 2002). The Gene campaign also brought a High Court action in Delhi in 2001 claiming that the illegal sales of seed in Gujarat, mentioned above, were done with the government's full knowledge. On other occasions, campaigns have helped to support the government. Activists have helped to strengthen India's negotiating position in international trade debates, for example. Yamin argues that 'Large-scale civil society protests against TRIPs in the early 1990s strengthened the Indian government's hand in international negotiations. As a result, India was one of the few countries that fought actively against inclusion of TRIPs in the Uruguay Round' (2003: 41).

Alongside this legal and research-based activism, there have also been many more confrontational forms of protest that would not be tolerated in China. There were protests at Monsanto's Research Centre in Bangalore when the company's *Bt* cotton crop was authorised for commercialisation in March 2002, as well as large public demonstrations outside the Asia Pacific Seed Association conference in Bangalore in September 2000 (Scoones 2003). More drastic still, is the concerted anti-Monsanto campaign led by the group KRRS (Karnataka Rajya Ryota Sangha). The farmers' group, based in Karnataka, led a campaign in November 1998 to "Cremate Monsanto", burning the company's field trial sites in the state. The same group orchestrated a raid on the offices of Cargill Seeds India, destroying office equipment and making clear their desire to see the company leave India. In doing so the group invoked the evocative independence slogan "Quit India" (Seshia 2002). Such campaigns have not just been directed at biotechnology per se, but at the forces behind the technology's development, identified as globalisation and trade liberalisation. Groups such as KRRS have been quick to forge these connections. Between 18 and 20,000 Indian farmers took to the streets of Delhi to protest against the Dunkel Draft of the then GATT Uruguay Round. The focus of the rally was the assertion of farmers' rights to produce, sell and exchange seeds against the perceived threat to these practices posed by the entry of foreign MNCs into the Indian market and the rights such firms acquire under the WTO TRIPs agreement (Seshia 2002). Protests around China's entry into the WTO have not been public, even if as noted above, dissenting voices have registered their concern within government, and there has been some access to mainstream media for commentators raising concerns about the impact of WTO membership on Chinese agriculture for example.

Despite the claims of the Chinese government, cited above, about the extent of efforts to engage the public in debate about biotechnology, there have clearly been greater proactive efforts on the part of GoI

to involve a range of civil society groups in the formulation of policies aimed at meeting international commitments. A joint parliamentary committee on the Plant Varieties Bill was appointed in 1999, for example, visiting 15 states in the country and recording oral evidence from farmers' organisations, experts and individuals. Similarly with the Biodiversity issue, while it was NGOs themselves that proposed consultation with government over the design of a Biodiversity Act, MoEF responded positively. The process of consultation that ensued led to the creation of an expert group that made recommendations regarding the Biodiversity Law. The final draft of the Biodiversity Bill was released by the MoEF for public comment and the NGO Gene Campaign produced a draft law on biodiversity that was discussed at national consultation seminars (Ramakrishna 2003). GEAC Chairman, A.M. Gokhale, reacting to the controversy about approvals of GM mustard has declared his intention to launch 'an open house debate by inviting all stakeholders to sort out the issue'.[53] Questions have been raised about the scope and depth of these consultations, and it is notable that RCGM and GEAC, the two central regulatory committees, have no formal requirement to involve NGO and industry representatives, even if they can be invited to participate as individual experts (Gupta 2000). But perhaps the fact that such consultations occur at all, highlights an important contrast with the policy style adopted by the Chinese government where consultations on most questions discussed in this paper have principally been undertaken within government.

It is difficult to form an accurate overall assessment of the extent to which the activities of civil society groups have successfully altered the ways in which global policy commitments have been interpreted and implemented in practice. Clearly in the case of India, challenges, legal and political, to the conduct of the process and the absence of public consultation have led to gestures ostensibly aimed at opening the process up. Vocal groups, however unrepresentative of levels of broader public engagement with the issues, have succeeded in raising the profile of biosafety issues and in so doing perhaps strengthened the hand of allies within government such as the Ministry of Environment and Forests. In China, SEPA has not been able to draw on allies in civil society in such an explicit way, though clearly publicity attracted to the *Bt* cotton controversy leant support to concerns they had been expressing. Instead, as noted above, they have relied on the authority provided by the Protocol itself to argue for a stronger emphasis on biosafety than their counterparts in the Ministry of Agriculture would like to see.

7 Conclusion

As relatively powerful developing countries, both India and China have attempted to domesticate global obligations in ways which conform with their domestic priorities. They have been able to resist, to a greater degree than many other developing countries, bilateral and commercial trade pressures to revise and reform their regulations to suit the needs of biotech multinationals or leading exporters of GMOs. China had to go some way to assure the US that its regulations were not discriminatory towards US exports and that interim arrangements would be put in place so as not to jeopardise the lucrative global

[53] 'Scientists raise eyebrows over GM crop safety', *The Financial Express*, 25 November 2002.

soybean trade. But its position across a range of issues continues to embody sufficient ambiguity and flexibility that it can preserve policy space to manoeuvre a position that reflects an evolving sense of the national interest. In some cases, the government position has been quite overtly oppositional to western commercial interests, the ban on foreign investment in the biotech sector in China being one obvious example.

The government of India has also been subject to intense foreign pressure, regarding its patent legislation in particular. It has been strongly encouraged to adopt a process-based patenting system that would allow firms to patent biological processes rather than just end products. The exemptions India included in its pre-TRIPs legislation in the areas of agriculture and pharmaceuticals in particular, as well as both its large domestic market and competitive potential as an exporter of these products, made India one of the targets of US global efforts to tighten IPRs. India has until 2005 to provide product patent protection that it has hitherto denied following a ten year transition period. The implementation of the provision has already been the subject of WTO dispute settlement. It remains the case, however, that despite these pressures the Indian government has sought to find creative ways of squaring the strengthening of the scope and enforcement of IPRs as required by TRIPs, with its long-standing commitment to balance IPRs against other policy goals such as public health and food security (Yamin 2003: 41).

Rather like the case of China, the Indian government has also been subject to lobbying from individual firms whose products are under consideration for approval. This has been documented at greater length elsewhere (Newell 2003a). The government of India has ultimately had to resist these pressures for some time, however, due to a combination of under-developed regulatory safeguards, the sorts of vocal pressure from civil society groups described above, and the slow process of learning by doing that characterises any bureaucratic procedures that are being operationalised for the first time. The relative importance of China and India as potential markets for GM products, the relatively advanced level of skills and infrastructure that the two countries can provide, as well as their function as symbolic signifiers for other developing countries about the future direction of biotechnology, all mean that exporters are willing to invest considerable effort in engaging and working with both governments to ensure that regulations are designed that accommodate, in important ways, their commercial needs.

The lack of civil society resistance, and the strong commitment from the Chinese government, was enough to drive biotech development in the early years. More recently, WTO membership and the need to identify more strategically where China's strengths lie in global market terms appears to have precipitated a re-evaluation of priorities. China has created a space to do this through a combination of strategic use of prevailing concerns about biosafety to challenge the unregulated import of GMOs from foreign investors, and the careful construction of regulations that are likely to benefit Chinese producers and traders more than foreign actors trying to operate in the Chinese market. It may be true to say that China is less openly vocal about its concerns regarding global trade and environmental instruments in the arenas where these are negotiated, but nevertheless finds creative ways to interpret and enforce it's obligations in a manner that leads critics to allege that the intent of those commitments is being subverted. India, on the other

hand, adopts a different negotiating style, more openly questioning of measures proposed by international institutions but perhaps ultimately more willing to meet the letter of those agreements when it comes to national enforcement.

The extent to which the domestic biotechnology policy processes of the two countries are shaped by global economic forces and the constraints imposed by international agreements to which they are party is, in part, a function of the role they see for biotechnology in their national agricultural systems. Within both countries, the debate about the role of biotechnology in agricultural development has strongly emphasised, rhetorically at least, the extent to which the technology can help to tackle problems of food insecurity within the country. While both countries are self-sufficient in food, poverty and problems of distribution, storage and transportation conspire to leave many people under-nourished and without access to food. There may be strong reasons for assuming, therefore, that both countries could develop relatively autonomous biotech strategies aimed at serving domestic need rather than global market requirements. The rhetoric within policy circles and emanating from biotech firms would suggest that this is the case. And yet what we see from the analysis above, is a desire on the part of both countries to be global players in biotechnology. To do this means meeting the requirements and obligations of global trade accords and attempting to reconcile these with corresponding commitments in environmental agreements such as the Cartagena Protocol on Biosafety. It means trying to define a competitive niche in global markets or, as in the case of China, envisaging a dual track strategy of GM and non-GM exports that spread the risk of being penalised by the volatile winds of shifting market realities and unpredictable consumer concern. As long as this desire to be key players in the global political economy of biotechnology persists, it is almost inevitable that international rules on trade and biosafety will continue to play an important, yet contested, role in their national responses to the regulation of GMOs.

On a policy level, this analysis suggests that expectations that countries can and will implement international treaty obligations in common and predictable ways, an assumption embedded in many trade and biosafety capacity-building programmes for example, are out of touch with the reality of uneven implementation, foot-dragging and conscious non-implementation of articles and provisions that are seen to be burdensome or inappropriate to national circumstances. Theoretically, the account presented here suggests the need to conceive of the links between national and international policy processes in more dynamic and less linear ways. We have seen how particular government departments, and even particular groups of individuals within those departments, forge global alliances with like-minded policy-makers in other governments as well as with allies in the private sector and civil society. In this context, the analytical benefit of talking about "levels of analysis" which separate the supposedly distinct spheres of domestic and international politics, as prevailing approaches in International Relations tend to, is of limited purchase. Though there is clearly not space to develop the contents of such an approach here, a global policy networks approach, which might draw on the work of Risse-Kappen (1995) and Keeley and Scoones (2003), for example, could represent a useful advance in this regard. In explaining why some networks and coalitions are more able to secure their interests than others, a 'political economy of

transnationalism' (Newell 2000) might also be appropriate to a field of enquiry so intimately related to questions of trade and competition.

The discursive element is important here also though. We saw how in the Indian context it serves some civil society groups well to construct global trade agreements as instruments of the new colonialism or how Chinese bureaucrats resistant to change have invoked socialist ideology to question the "anti-socialist" agenda of the WTO (Breslin 2003). Business groups and "globalising bureaucrats" equally represent WTO membership as central to the prospects of economic growth. While some international instruments, including elements of the Cartagena Protocol, are seen as burdensome and unenforceable, other aspects are seen as enshrining key rights and affording important safeguards against the risks associated with GMOs. The observation about bureaucratic politics that "where you stand is determined by where you sit" is pertinent to understanding the process by which global commitments get refracted through the prism of bureaucratic and discursive politics at the national level.

The account provided in this paper also underscores the importance of seeing states not as theoretically bound and homogenous entities, but rather as complex configurations of competing political and bureaucratic units adopting unique policy styles and embedded in different ways within the sorts of global economic and policy networks described above. Taking states and the question of state-form seriously, requires us to move beyond viewing global politics as the product of relations beyond the state to look instead for the sources of global policy *within* the state and its networks to global coalitions of interest. It also requires us to locate the roots of domestic policy processes within the global coalitions that transcend state boundaries to simultaneously create opportunities and constraints within which states have to operate. Only then will we be well positioned to capture the dynamic nature of the global politics of biotechnology and the multiple theatres in which it is staged.

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